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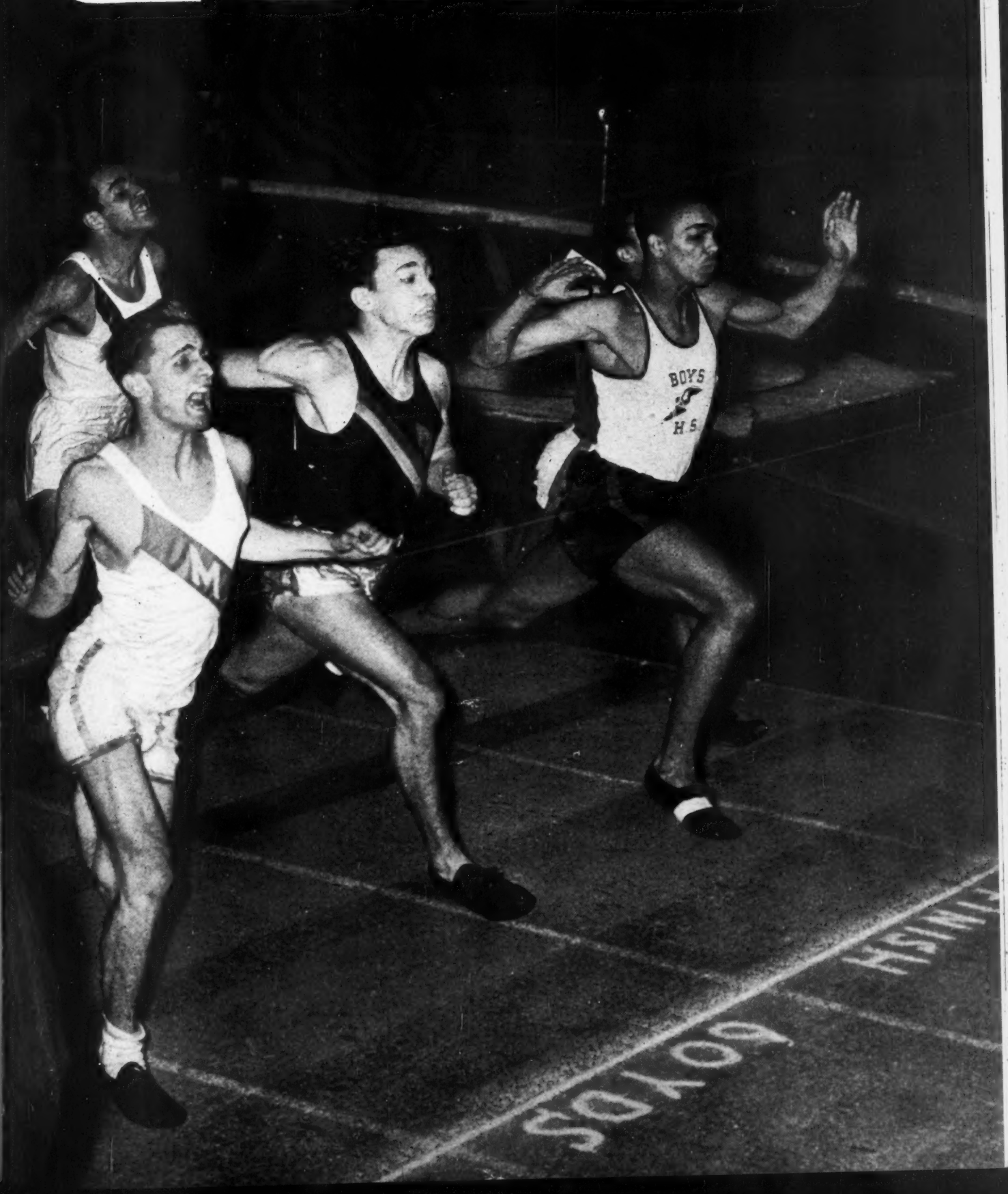

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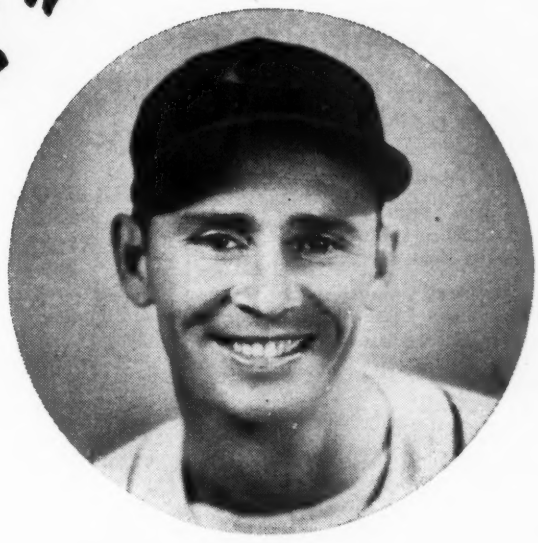

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Here Below

Officially speaking

MANY of the schoolboy basketball officials in our neck of the woods are a bit uneasy these days. And you can hardly blame them. Just the other week one of their colleagues dropped dead of heart failure while working a game.

It was a shock in every sense of the word. The man was an experienced official, apparently in the best of health, and had never had any trouble with his heart. Yet, bang! He went just like that.

Such accidents are bound to occur once in a while. But we don't believe many of our officiating boards are doing all they can to prevent them.

In reviewing the requirements laid down by various boards, we were struck by the lack of attention paid to physical examinations. In most cases, the responsibility for the official's condition is left to the official himself. The feeling seems to be that the official is a grown man and should be smart enough to take care of himself.

This sort of reasoning is specious. All of us are careless of our health, especially when we have lots of it. We tend to forget that it can deteriorate without our knowing about it, especially when the body is subjected to constant punishment—as it certainly is in basketball officiating.

We believe that every board of officials should insist on a rigid physical exam before and after every season—that each official should be required to submit a doctor's o.k. before being permitted to work.

Under "physical conditioning" the *Manual of Basketball Officiating* prepared by the Collegiate Basketball Officials Bureau, states:

"Basketball officiating is physically exhausting and requires a sound body and an alert mind. Those men who have bad eyes, poor heart, weak legs, or slow wit have no place in basketball officiating. An official should take the sensible precaution of undergoing a thorough medical examination prior to the start of each season and should also *go through a rigorous training program in order to be in shape for his first job of officiating.*"

Any official who starts the season without preparing himself physically for it, is not only being unfair to the schools and the athletes, but is leaving himself wide open to injury.

Too many men go into their first game without the benefit of a single workout. When you remember that most officials are no longer youngsters and haven't been too active during the off-season, it is easy to see how the heart can give way under sudden exposure to strain.

If even the kids must pass an examination before being permitted to take the floor, shouldn't the officials be required to do likewise?

Remember, too, that while you can always substitute for a tired player, you can never substitute for a tired official. And nine times out of ten, the official needs the rest more.

So play safe, men. Make sure to get yourself thoroughly checked before accepting any officiating assignment.

SHOULD intramurals be a distinct entity or an integral part of the physical education program? That is the gist of an interesting communique from William Edd, of the Franklin Junior High School, Aliquippa, Pa. He writes:

The objectives of intramural athletics are in complete accord with the objectives of physical education, namely:

1. Physical growth and the improvement of body function.
2. The development of sound social and moral qualities.
3. The development of sound mental and emotional attitudes.
4. The development of general and specific skills.
5. The development of worthy use of leisure time.

Any program of intramural athletics which does not achieve these purposes cannot justify its existence.

Originally, this program was predicated on the democratic principle of equal opportunity to all pupils. It did not exclude the awkward youngster and it did not bar the pupil of mediocre ability. On the contrary, it specifically encouraged them.

Unfortunately, the intramural program of today is pulling away from this basic concept. This has produced many weaknesses, the more palpable of which are:

1. The use of preferential groups as a "feeder" system for varsity teams.
2. A lack of carry-over value due to the exclusive use of team sports such as football and basketball.
3. Supervision under incompetent personnel.
4. A lack of coordination with the regular physical education program.

How may these abuses and weaknesses be ameliorated? The writer believes that the solution lies in making intramurals a coextensive part of physical education by dovetailing the program with the instructional phases of the physical education program.

From an educational standpoint, this inter-relation can only produce beneficial results. Some of them might be enumerated:

First, the physical education program would have an opportunity to give each child adequate training in the fundamental skills of individual and team sports.

Second, the intramural program could be used primarily for the actual playing of these individual and group games.

Third, if the physical education program is in charge of a trained specialist, both programs would profit by his leadership.

Fourth, there would be greater participation in the intramural program due to incentives stressed in physical education.

Fifth, it would eliminate the exploitation of youth for the sake of winning teams, which frequently happens when intramurals are divorced from the physical education program.

The sum and substance of this paper can be stated axiomatically: "A body of water can never run higher than its source." Similarly, an intramural program can never achieve a goal higher than that set by the persons responsible for its execution.

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TODAY IN SPORTS EQUIPMENT

Infielder straddling the bag for the tag on an incoming runner.

Diamond Drills

By ROBERT TIERNEY

Coach, Queens College

MANY baseball coaches, particularly up north in the treacherous spring weather belt, are compelled to spend most of their pre-season training time in the gym.

Necessity is the mother of invention, and it will behoove the coach to plumb the depths of his ingenuity. The writer, after 14 years of "plumbing", has evolved a series of drills which can be employed by any high school or college coach faced with this dilemma. These drills may be used on any indoor area having a minimum floor dimension of 70′ by 30′.

The drills are set up with three objectives in mind: (1) for general conditioning to loosen arm, shoulder, leg, and thigh muscles; (2) for practice on the fundamentals of throwing, catching, base running, bunting, fielding, pitching, and sliding; and (3) for development of specific techniques for pitchers, catchers, and infielders.

Before instituting this drill program, the coach should offer a graded system of individual and dual calisthenics for body conditioning. This is necessary to properly attune the muscles used in the game and which may have had little activity during the winter months.

The stress should be placed on stretching, twisting, and bending, involving the muscles of the neck, upper arm and chest, trunk, thighs, and legs. The exercise program should be gradual in scope and intensity and should form a major part of the first few indoor sessions.

At the start of indoor practice, the coach should divide the squad into two classes: (1) battery candidates, and (2) infielders and outfielders. It is then possible to demarcate the area so that several different drills may be carried on at one time. Good safety precautions are essential, and these will be discussed later on.

BATTERY DRILLS

Mark off half of the area for the battery. Within this area, measure off a distance of 60′ 6″. Chalk in a pitcher's rubber at one end and a home plate at the other. Set up as many of these areas as space will permit, keeping them parallel to one another and at least 6′ apart.

Control Drill: Control is the greatest of all pitching assets and constant practice is necessary to obtain it, even after proper stance and body motions are mastered. The drill should start with the pitcher aiming at a spot directly over the plate, belt high. When control in this area is secured he should pitch directly over the plate shoulder high, then knee high.

When the coach is satisfied that the pitcher can consistently place the ball in these areas, he should direct the candidate to practice pitching to the inside and outside of the strike zone. The pitcher should first use the catcher's glove as the target, then practice throwing to the catcher's knee or shoulder when pitching outside and inside.

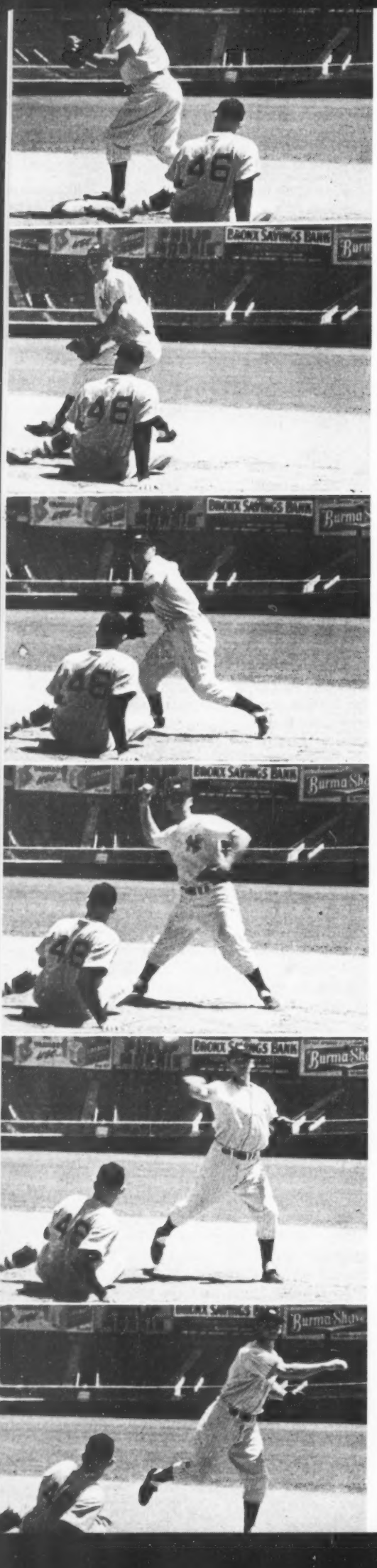
Pick-Off Drill (First Base): In setting up this drill, use a catcher, pitcher, first baseman, and a base runner. The pitcher stands with his pivot foot on the rubber and the forward foot slightly off line toward first base. In this position, he can see both the batter and, by peripheral vision, the baseman and the runner. The pitcher should start with a few throws to the plate; then, using the same motion, complete a throw to the baseman.

In using this drill the coach should stress the following points: (1) A peculiarity of pitching motion that will prevent base runners from easily determining whether the pitch is to be made to the plate or to the baseman. (2) The throw to the base is intended mainly to keep the runner close rather than to catch him off base. (3) Vary the throw to the baseman. Use three-quarter speed in most cases, then a quick snap throw. (4) Make the throw knee high and on the side of the base toward the runner.

INFIELD DRILLS

While the battery is working on one half of the floor, the infielders should be going through their paces

(Continued on page 52)



By ETHAN ALLEN
HEAD COACH, YALE UNIVERSITY

Double 'em Up!

THE double play is baseball's greatest and most spectacular exemplar of team play. No one who sat in on the 1948 World Series will ever forget the speed and finesse with which Cleveland's Lou Boudreau and Joe Gordon executed the play. Their double killings choked off several vital Boston opportunities and contributed very concretely to the Cleveland triumph.

All of us have seen many a promising rally started, then abruptly shattered by the smooth ball-handling and nimble footwork of the shortstop and second baseman.

One incident I recall clearly occurred in a game between the Chicago Cubs and the self-same Boston Braves. The Cubs were winning handily and Casey Stengel, the manager of the Braves, was taking a good-natured ribbing in the third-base coaching box. Then three consecutive Brave batters reached base.

Now Casey began to have fun. He derisively waved both hands toward the Cub bull-pen and, sure enough, activity began. Then the worst happened. The next batter hit a ground ball and a 6-4-3 was recorded on the score-cards. That put the quietus on Mr. Stengel. Poor Casey stood hopelessly in the coaching box, a comical study in chagrin.

There are definite types of footwork in making the double play. As a rule, however, the speed with which the pivoter can get to the bag will determine the resulting action.

If the pivoter can reach the bag early, he may execute a maneuver inside or outside the base-line. If he cannot check his speed at the bag, he can only employ some over-the-bag tactic.

Even with the speed factor considered, there is no set procedure, for individual tastes differ. In fact, some players find it difficult to explain exactly what they do. You have to get them on the ball field to obtain a clear picture of their style.

The point is, they execute the pivot naturally—so much so that they probably never had to be taught anything about footwork around the bag.

On the lower levels, the problem is more acute. While the shortstop and second baseman may have the natural ability, they seldom form a satisfactory double play combination.

The two players in these positions are usually there merely because they happen to be the only boys who can play them with any degree of skill. Having had little previous coaching or experience, they seldom function well as a unit.

It is up to the coach to explain and demonstrate the mechanics of the various pivots, then have the player select and practice the footwork that seems to best fit his ability. With faithful practice, the boys will eventually start completing the routine double plays.

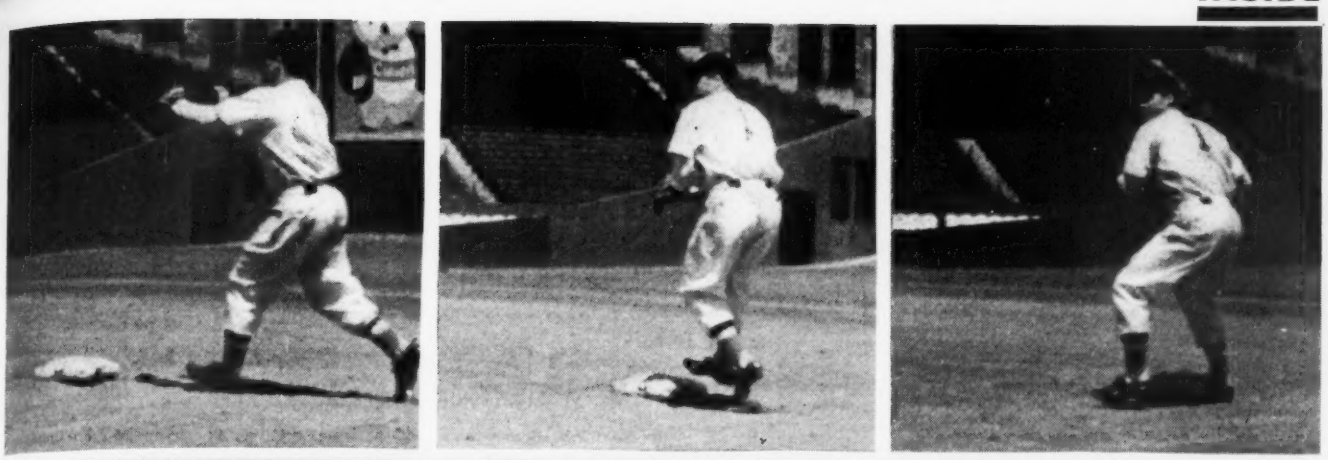
The first out is the prime consideration in the double play attempt. Most youngsters are so eager to get the second man that they often mess up the first out, and wind up with no out at all. That is why every coach repeatedly yells, "Make one sure!"

The throw or toss to the bag must be accurate, with the ball reaching the pivoter shoulder high. The speed of the throw is another important factor, particularly when the pivoter is moving toward the bag. The throw must reach the bag just as the pivoter gets there. Otherwise there is danger. If the throw is slightly wide, for example, the pivoter may find it impossible to change his course and make the catch.

The actual footwork on the pivot

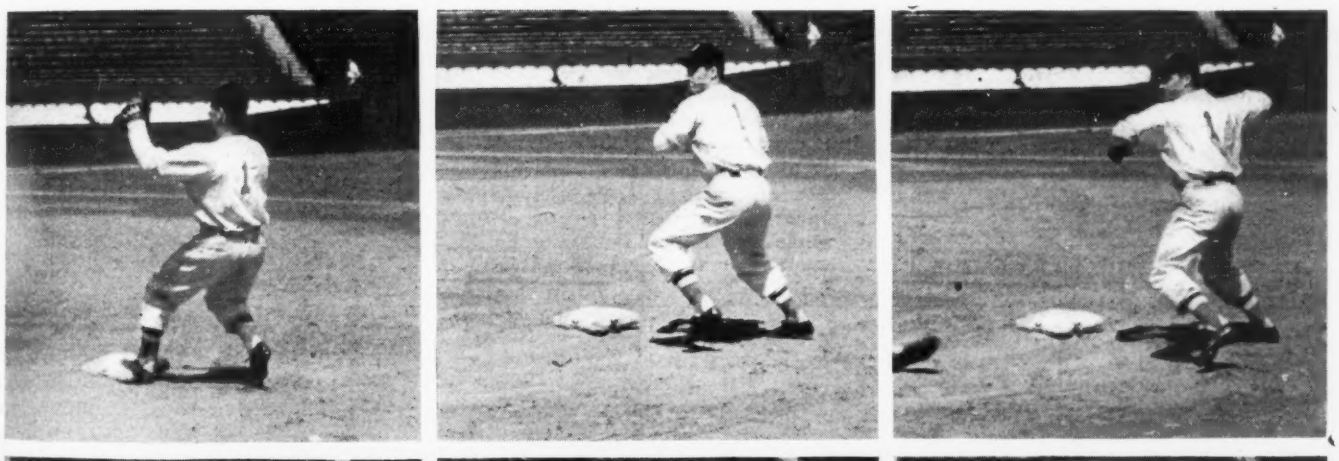
JOE GORDON

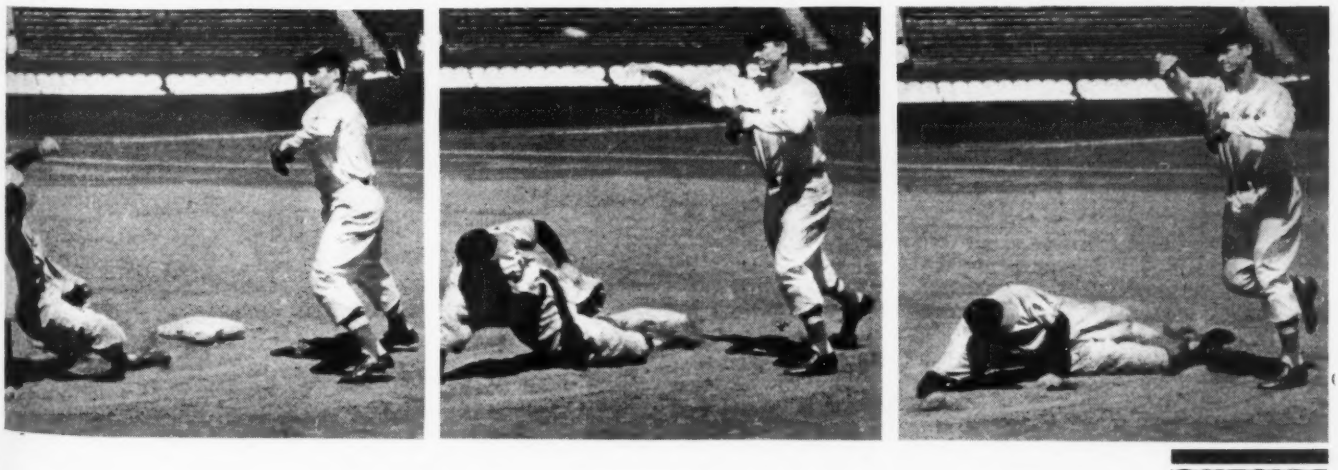
The flashy Indian second baseman illustrates the push-back technique of pivoting. He catches the ball as he hits the bag with his left foot, pushes back to the outside of the base-line with the same member, and steps toward first for the throw. The same technique (from a different angle) is demonstrated by Bobby Doerr in the lower sequence on the facing page.

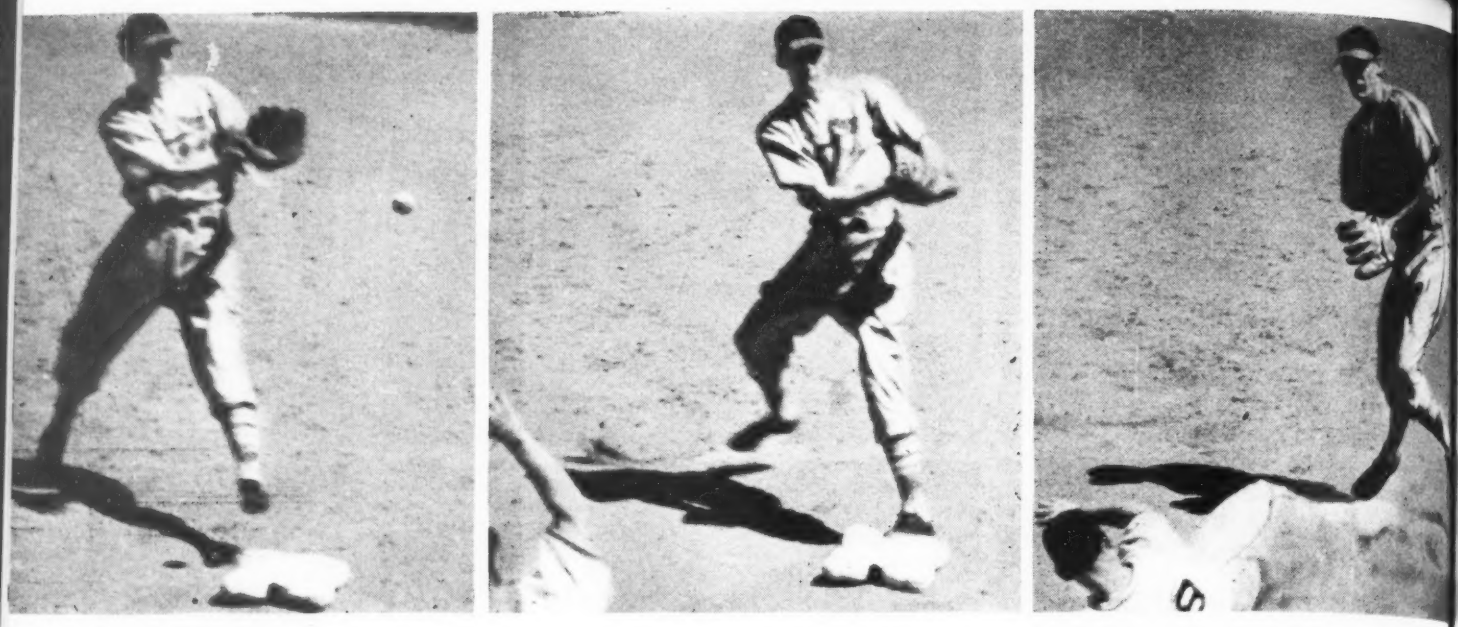


Bobby Doerr, 2nd Base

Above: The Red Sox pivot man hits bag with right foot, steps inside line with left foot, and throws with a leap (moving-over-bag technique). *Below:* Doerr hits with left foot and pushes back to outside with same foot for throw to first.







varies for the two positions, inasmuch as the shortstop approaches the bag one way and the second baseman, another. The shortstop takes most throws from the second baseman while moving over the bag, since his movement into the base usually places him in good position to throw to first.

Some shortstops hit the bag with their right foot, then step toward first with their left.

Another popular technique is a drag step. In this case, the shortstop catches the ball as his right foot comes down near the bag, then hops with the same foot to execute his throw, meanwhile dragging his foot over the bag. A hop may also be employed with the former (step-on-the-bag) technique.

The second baseman also possesses a variety of pivots. If the bag can be reached early, several possibilities present themselves.

Some players prefer to straddle the bag, then bring the left foot back to the bag to complete the force-out. In this case, the step for the throw may be made to the inside or outside of the base-line; or, if the approaching runner cannot interfere with the throw, directly toward first base.

Inside and outside tactics are employed whenever the runner is close enough to slide into the pivoter.

Some second basemen like to time their approach so that they can step over or back from the bag to thwart the slider. In these contingencies, the footwork is usually conventional,

•

MARTY MARION

The lanky Cardinal shortstop illustrates a rather unique pivot in this sequence. He hits the bag with his *left* foot, crosses his right leg behind, and hops to the outside of the base-line. As his right leg hits the ground, he steps toward first with his left foot and throws with a sweeping sidearm motion. This is unusual footwork and though it cannot be recommended for younger players, it disproves the theory that a shortstop has to make the force-out and pivot in a specific manner.

with the right foot completing the tag. This facilitates the throw since the weight is on the correct foot as the ball is caught.

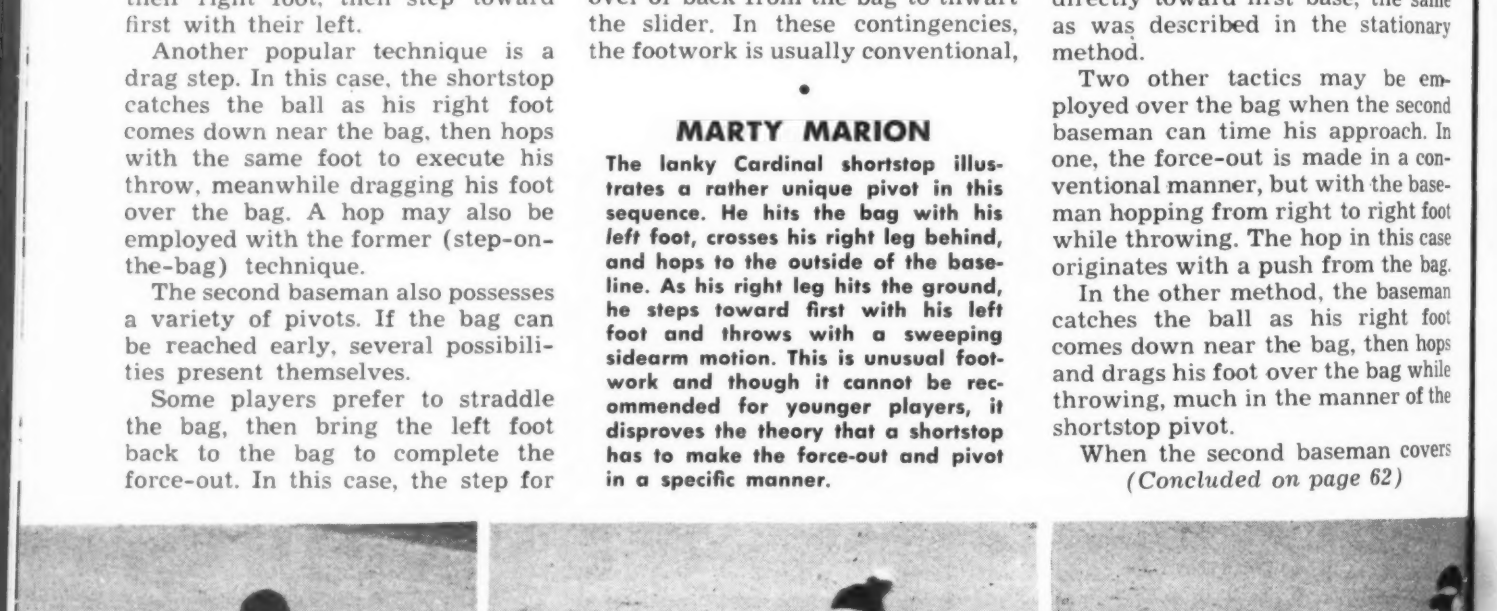
The complete action may be generalized as follows: The ball is caught as the right foot alights on the bag, the left foot steps inside or outside the base-line, and the player throws. The step may also be made directly toward first base, the same as was described in the stationary method.

Two other tactics may be employed over the bag when the second baseman can time his approach. In one, the force-out is made in a conventional manner, but with the baseman hopping from right to right foot while throwing. The hop in this case originates with a push from the bag.

In the other method, the baseman catches the ball as his right foot comes down near the bag, then hops and drags his foot over the bag while throwing, much in the manner of the shortstop pivot.

When the second baseman covers

(Concluded on page 62)



By RICHARD V. GANSLEN

High Hurdling

★ DILLARD

★ DUFF

★ FINLEY

See pages 12-13 for action sequences

HARD though it may be to believe, it pays to be ignorant in scientific research. Only then can the researcher approach the problem without any preconceived notion of what he will find.

In the preparation of this hurdling study, the writer kept this in mind. He deliberately avoided reading any articles referring to any research materials on the subject.

Thus, the data presented here represents only what was found in the analysis, and it is expected that some of it may conflict with the opinions of connoisseurs of the hurdling art.

Harrison Dillard of Baldwin-Wallace, Lloyd Duff of Ohio State, and Sherwood Finley of Yale, were asked to run some high hurdles for the writer under controlled conditions; controlled that is, with regard to the camera speed and the various distances and angles.

The hurdlers were requested to run over one hurdle from their normal starting position and at the same speed they would use in a race. The time chosen for the trials was a hot, windless day in the mid-week preceding the National AAU Championships at Lincoln, Neb., last year.

The writer has every reason to feel that the subjects did their best under the existing conditions, but recognizes the possibility that the lack of competition might have caused the men to loaf a bit.

Three trials were made for each man. Further attempts to time these men in the finals of the Nationals were frustrated by a "hurdle mover" getting in the way of the camera just as the field went by. This data would have been extremely valuable as Dillard ran 14 flat in this race.

The time of flight for each hurdle, the distance traveled, and the average velocity over the hurdle was computed from the films.

In this study, Harrison Dillard remained in the air an average of *.491 sec.* ± *.0175 sec.* either way. On one of his attempts, Dillard traveled *12.66 ft.* over the hurdle, taking off *7 ft. 2 in.* before the hurdle and landing at *5 ft. 6 in.* On another attempt, Dillard traveled *13 ft. 2 in.* with the take-off at *7 ft. 5 in.* and the landing at *5 ft. 9 in.*

Dillard's average travel, by his own admission, is approximately *13 ft.* Dillard's average clearance velocity, using average clearance distances and time data from the films, was *26.33 ft.* per sec. This data being applicable to the first hurdle only.

Lloyd Duff of Ohio State, one of the country's leading decathlon competitors and a steady 14.4-14.6 hurdler, presents quite another picture here.

Duff had an average flight time of *.412 sec.* over the hurdle, but on his poorest attempt he remained in the air *.456 sec.* and on his best attempt cleared the hurdle in *.368 sec.*

The correction factor, as applied to Dillard's data, applies here also. Duff's average clearance velocity was *27 ft.* per sec. with his best clearance velocity *30 ft.* per sec. On Duff's fastest clearance, he traveled *11 ft.* over the hurdle taking off *6 ft. 1 in.* in front of the hurdle and landing at *4 ft. 11 in.*

Duff's take-off velocity was computed at *33.2 ft* per sec. while his landing was made at approximately *22.5 ft.* per sec.

Sherwood Finley of Yale, a steady 14.5 or so hurdler, presents the most efficient picture from the time viewpoint.

Finley was timed for his first hurdle in *.386 sec.* and in another attempt in *.351 sec.* In one attempt, Finley got off much too close to the hurdle, but maintained his form excellently throughout the flight.

Finley's travel was on the average *10 ft. 2 in.* with a take-off at *5 ft. 9 in.* and the landing at *4 ft. 5 in.* Finley's average clearance velocity was *27.6 ft.* per sec. for his hurdle flight.

It is interesting to note that Ed Dugger of Tufts generally clears *11 ft. 6 in.* on his first hurdle and builds this distance up to approximately *12 ft.* at the third hurdle. Finley and Dugger are built about the same.

Harrison Dillard is 24 years old, 5 ft. 10 in. tall, and weighs 155 pounds. His Reciprocal Ponderal Index by Cureton's Standards is *13.03*, which means he has a linear body type although not possessing the height one expects in *14* flat hurlers.

It is interesting to note that when Dillard's picture was mixed with 20 other national ranking athletes in an Anatomy Class Section, the men did not select him for a hurdler.

Duff, who is also 24 years old, is approximately 5 ft. 11 in. in height and weighs between 155-160 pounds. Although Duff's body type approximates Dillard's, he possesses longer legs in proportion to his trunk than does Dillard; and despite a light bony frame, he is very well muscled as a result of a great deal of pole vaulting, in which event he has reached 13 ft. 8 in.

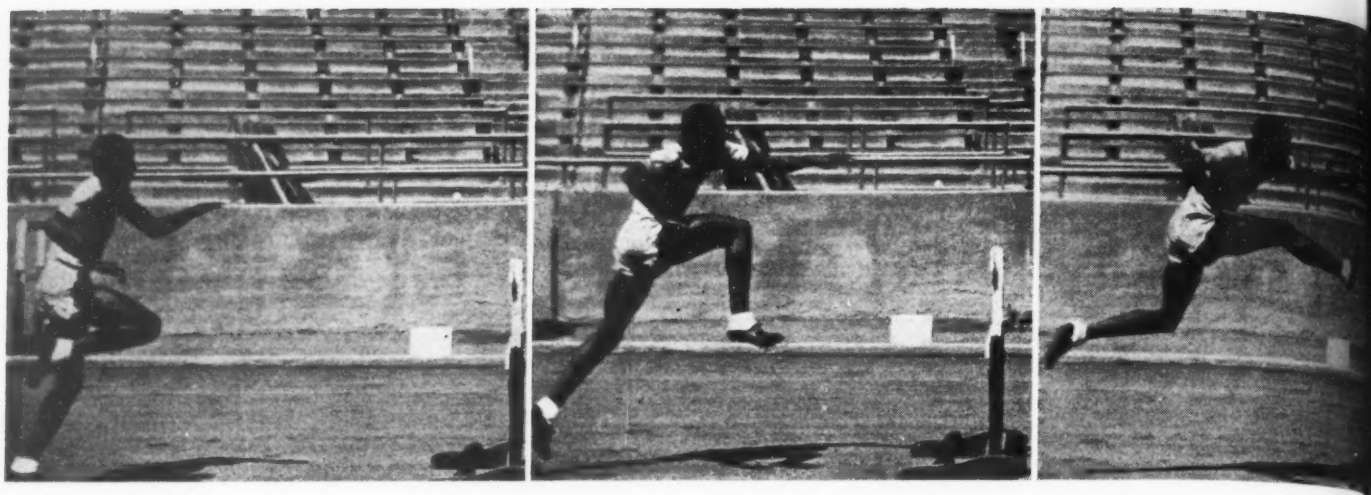
From the point of view of body build, Finley is the coach's ideal hurdling type. He is 25 years of age, 6 ft. 3½ in. in height. His Ponderal Index is *13.62*. He is the well-muscled, tall athlete type with a weight of 170 pounds.

In general, Finley approximates the picture of the great hurdlers of the past such as Walcott, Towns, Percy Beard, Dan Caldemeyer, Ed Dugger, and many others; while Dillard and Duff fit the picture typified by Allen Tomlich of Wayne University, former holder of the world's indoor high hurdles record.

Dillard put this record at 7.1 sec. in the Chicago Relays last March when chased by Porter of Northwestern, Duff, and Ed Dugger.

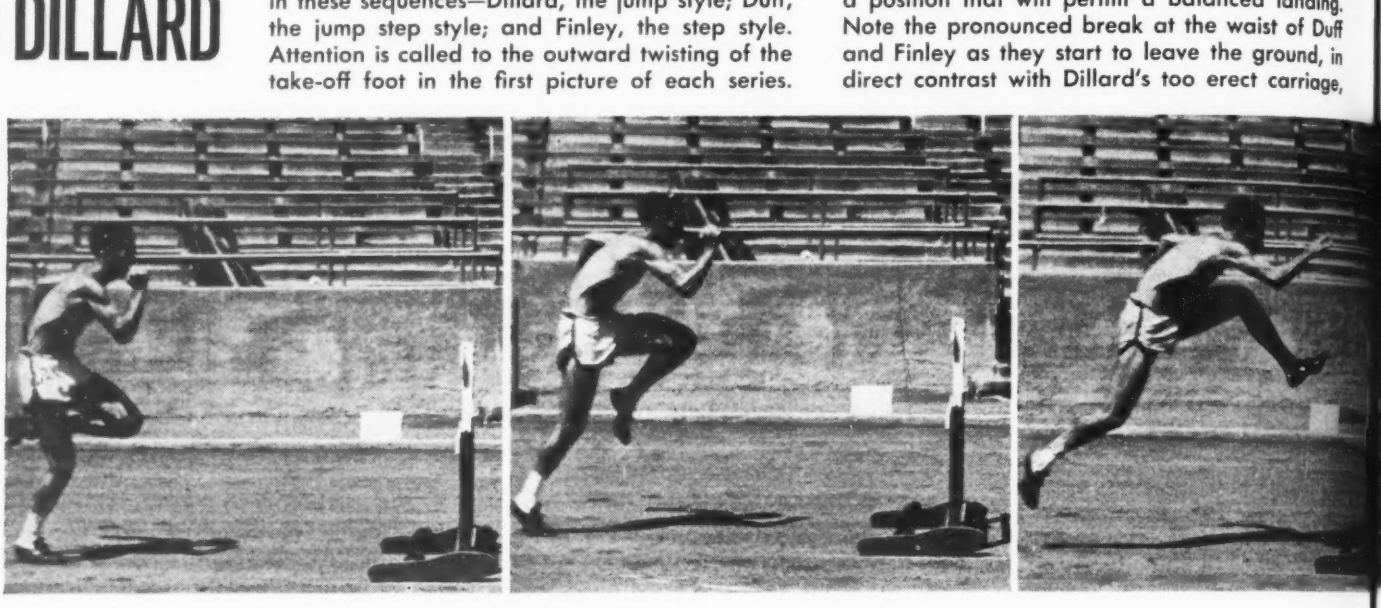
For years, coaches have been guessing at how long a period of time a hurdler should remain in the

(Continued on page 56)



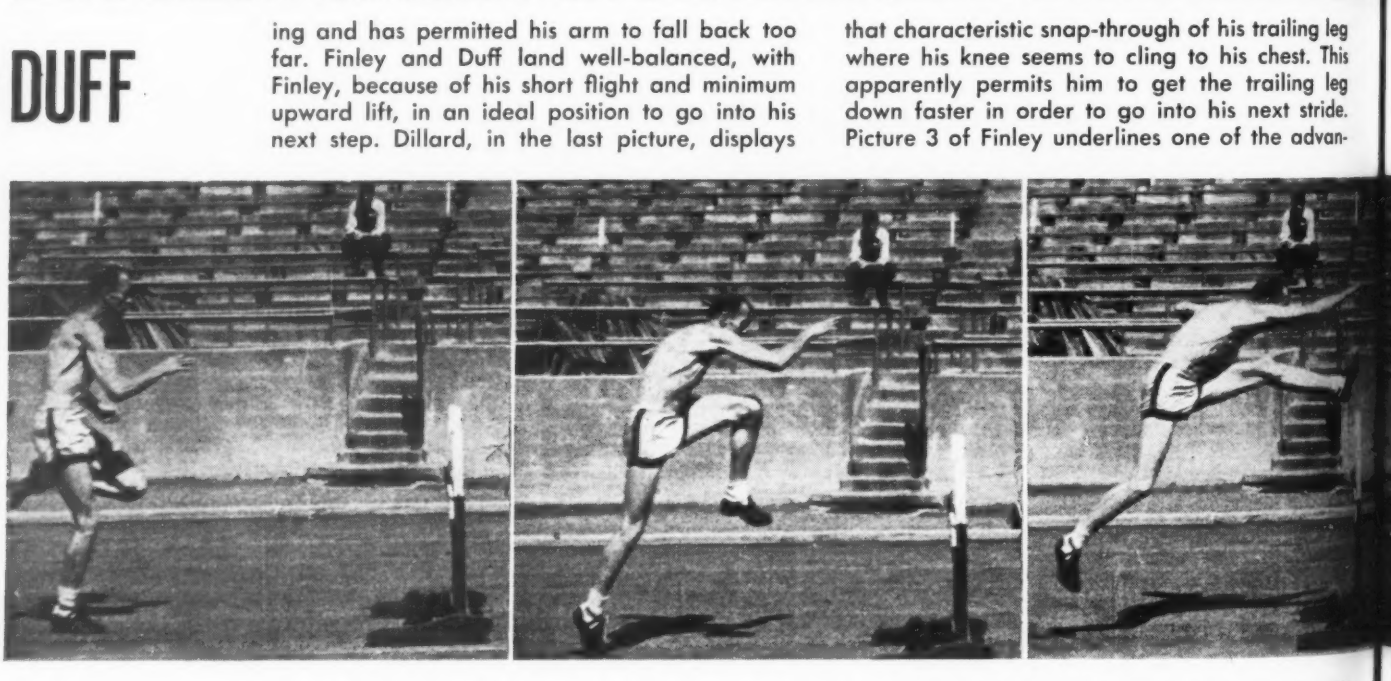
★ DILLARD

Three rather distinct clearance styles are depicted in these sequences—Dillard, the jump style; Duff, the jump step style; and Finley, the step style. Attention is called to the outward twisting of the take-off foot in the first picture of each series. The purpose of this is to shift the body weight to a position that will permit a balanced landing. Note the pronounced break at the waist of Duff and Finley as they start to leave the ground, in direct contrast with Dillard's too erect carriage,



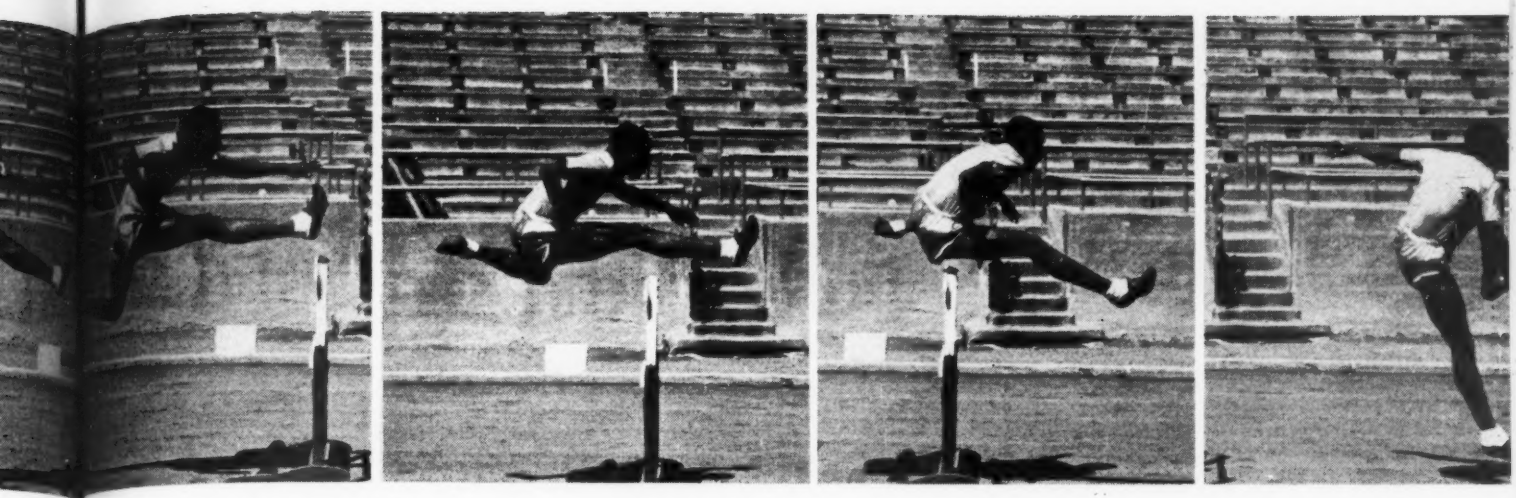
★ DUFF

ing and has permitted his arm to fall back too far. Finley and Duff land well-balanced, with Finley, because of his short flight and minimum upward lift, in an ideal position to go into his next step. Dillard, in the last picture, displays that characteristic snap-through of his trailing leg where his knee seems to cling to his chest. This apparently permits him to get the trailing leg down faster in order to go into his next stride. Picture 3 of Finley underlines one of the advan-

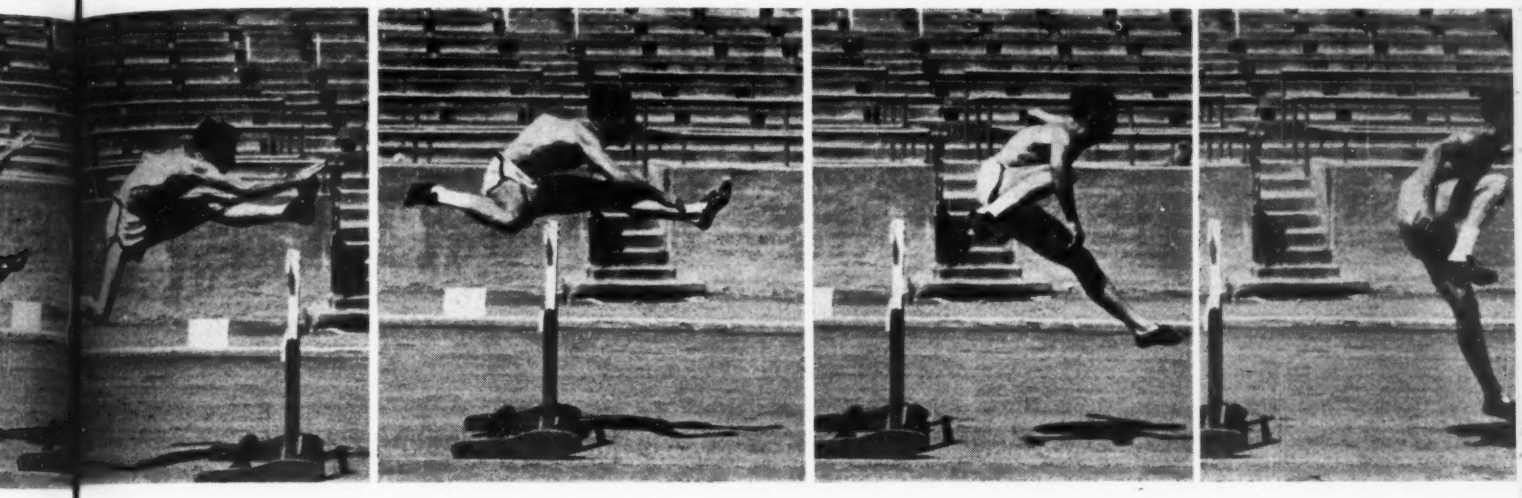


★ FINLEY

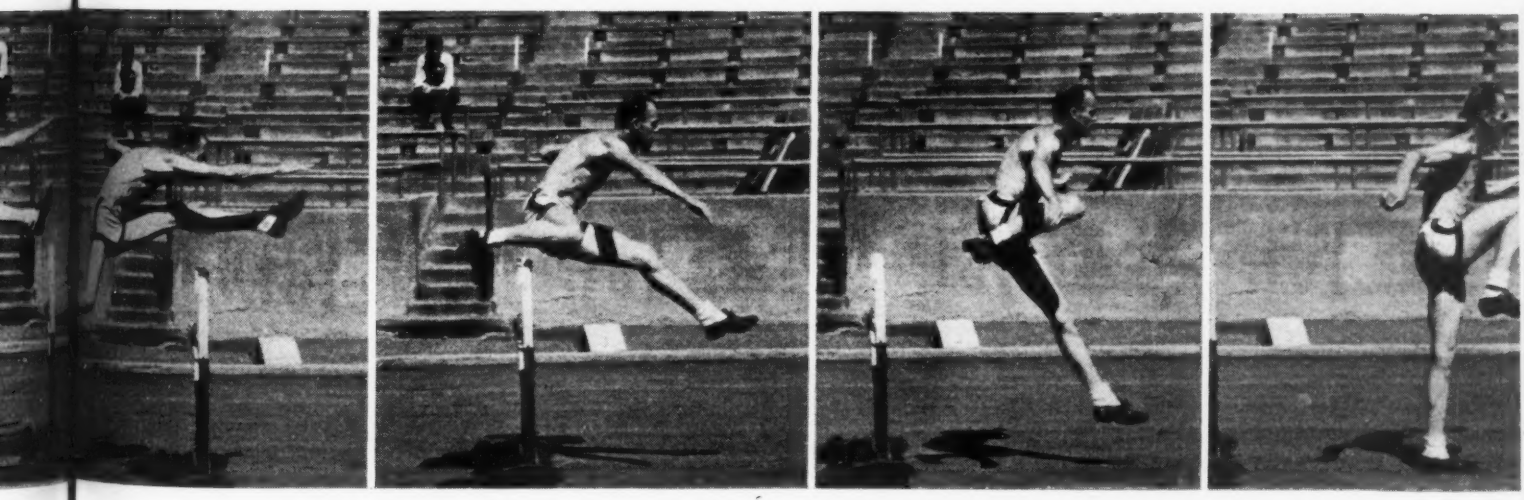
exemplifies the median type of clearance, minimal up-and-down clearance commensurate with his height (achieved with good flexibility and a pronounced tuck), and a flight path not significantly longer than Finley's but proportionate to the drive of his takeoff and the necessity of riding his flight and landing to get into position for the next step. The ideal hurdler would seem to combine the stretch and quick clearance of Finley with the Duff layout and Dillard recovery



which is more characteristic of a broad-jump takeoff. Next note the vigorous forward upward (not upward forward) drive of the lead leg of all the men. This adds to the velocity of their takeoff and prevents their clearing too high. The gather or tuck of Duff's body as he clears the hurdle is the epitome of form. Seldom does one observe such a beautifully balanced and poised clearance. The excellence of the arm action is also worth noting. Duff's arm action is excellent, whereas Finley apparently threw his arm too high in the lunge. Dillard gives some evidence of an off-balance land-



tages of height in hurdling. Despite the fact that all three hurdlers leave the ground at relatively the same distance before the hurdle, Finley, before his foot is more than 12 inches off the ground, has his heel almost ready to start down over the hurdle. Compare this picture with those of Dillard and Duff who are still rising to the hurdle clearance. From tracings of the path of flight of these hurdlers, it is evident that Finley makes a minimum up-and-down and forward clearance, while Dillard rises to a peak height early, so that his path of flight is quite flat or sustained. Duff



and speed between the hurdles. *(Ed. note:* For purposes of clarity, the pictures of Dillard and Duff have been reversed. That is, Dillard, who is shown here leading with his right leg, actually leads with his left; while Duff, who is shown leading with his left leg, actually does so with his right. It was thought that this method of mounting the pictures would facilitate their use by coaches without detracting from the mechanics of form.) Dillard, Duff, and Finley ran these hurdles expressly for Richard V. Ganslen, whose scientific findings therefrom appear in his article on pages 11, 56-59.

Operation Outfield

By CARL E. BOLIN

GOOD outfielding calls for excellent judgment of fly and ground balls, fleetness of foot, intelligent diagnosis of the hitters, and a strong, accurate throwing arm.

One of the more basic mistakes made by most young outfielders is playing the position too deeply. They usually do this because they have more confidence in their ability to come in than to go back.

Constant practice on going back at different angles and taking fly balls on the run will develop confidence and encourage the boy to play more shallow and thus cut off many damaging Texas leaguers.

All the great center fielders were famous for their ability to play shallow. This does not mean they did not play deeper for the longer hitters. They certainly did. But their position was always shallower than that of the average outfielder.

It is also well to remember that these star outfielders possessed great skill going back as well as excellent judgment on where to play the hitters.

Basic stance. The outfielder must realize the importance of starting with the crack of the bat. A good stance, hence, is a basic essential. The fielder should take a comfortable, crouched ready position with the knees bent and the feet well spread for good balance.

He should face the hitter squarely with the feet on a line, not one ahead of the other. Keeping the arms straight and relaxed with the hands on the knees will help keep the entire body relaxed.

After each pitch, the fielder may straighten up. But he should never be caught standing erect when the ball is hit. To keep loose, he may move around a bit between pitches.

Going after balls. On balls hit to the right or at a slight angle back to the right, the fielder should drive hard off the left foot, using the right foot as a pivot. This allows for a faster start and a longer first step.

On balls hit at a greater angle back to the right, it will be necessary to take the first step with the right foot.

The same principles of footwork hold true on balls hit to the left. The footwork is merely reversed.

Remember, when practicing, that the big objective is to get a fast start. Refrain from laying down any hard and fast rules. What is the best method for one boy may not necessarily be the best for another.

Nearly all young fielders fail to use their arms properly when going after the ball. They stretch their arms out too soon, thus killing the running stride.

As in sprinting, the arms may be a great help. They should be swung at the sides in line with the run, and not brought across the chest. No sprinter ever won an important race without properly utilizing the arms, and an outfielder is a sprinter when going after a ball. By reaching too soon with outstretched arms, he will lose many a hard chance.

Playing ground balls. Good outfielders develop their skill on ground balls by constant and painstaking practice. The fielder should charge in fast with the feet well under the body to allow for better body control in case of a bad bounce.

While in motion, the body should be alert but relaxed and the boy should try to play the ball on the big hop, remembering that few outfields are as smooth as the infields.

It is a good idea to play ground balls safe, but many situations will arise when a fast play will be essential to cut off a run. A knowledge of the speed and reputation of both the batter and the runner will help determine whether to play the ball safe or to charge it.

Making the catch. When no one is on base, the fielder should make sure to get directly under the ball in order to insure the catch.

Both hands should be used whenever possible. The player should form a big pocket with the hands and watch the ball all the way in to the glove. The hands should be kept far enough out from the body and should give with the impact. Stiff arms, hands, wrists, and fingers invariably produce errors.

On high flies, the palms should be extended upward at least head high without blocking the vision.

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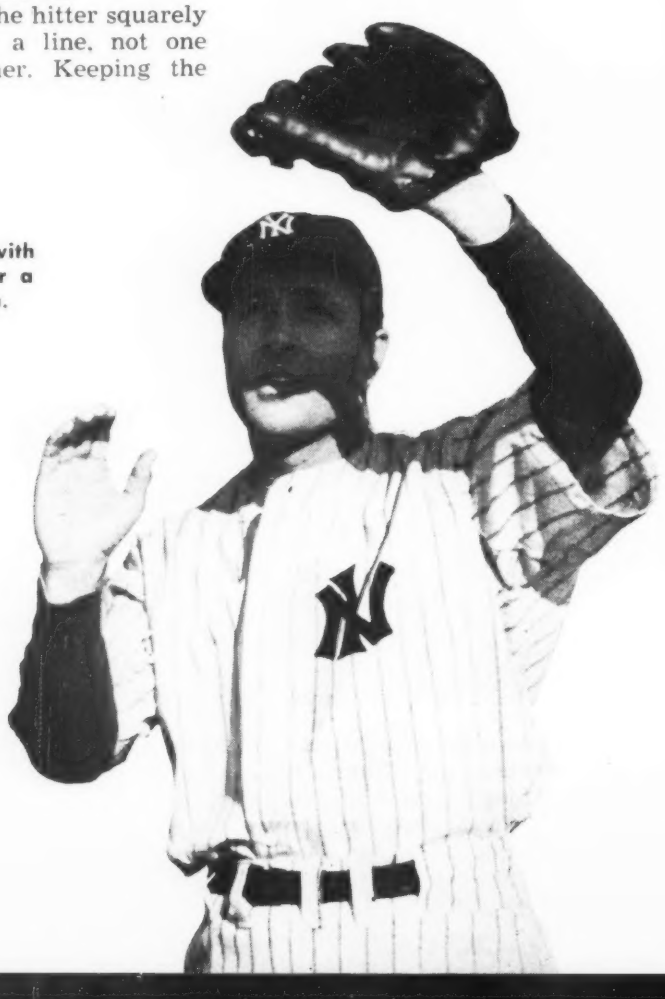
Throwing. The power and accu-



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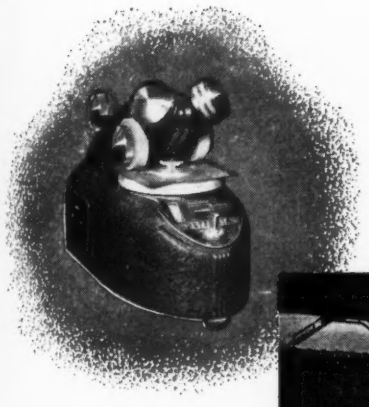

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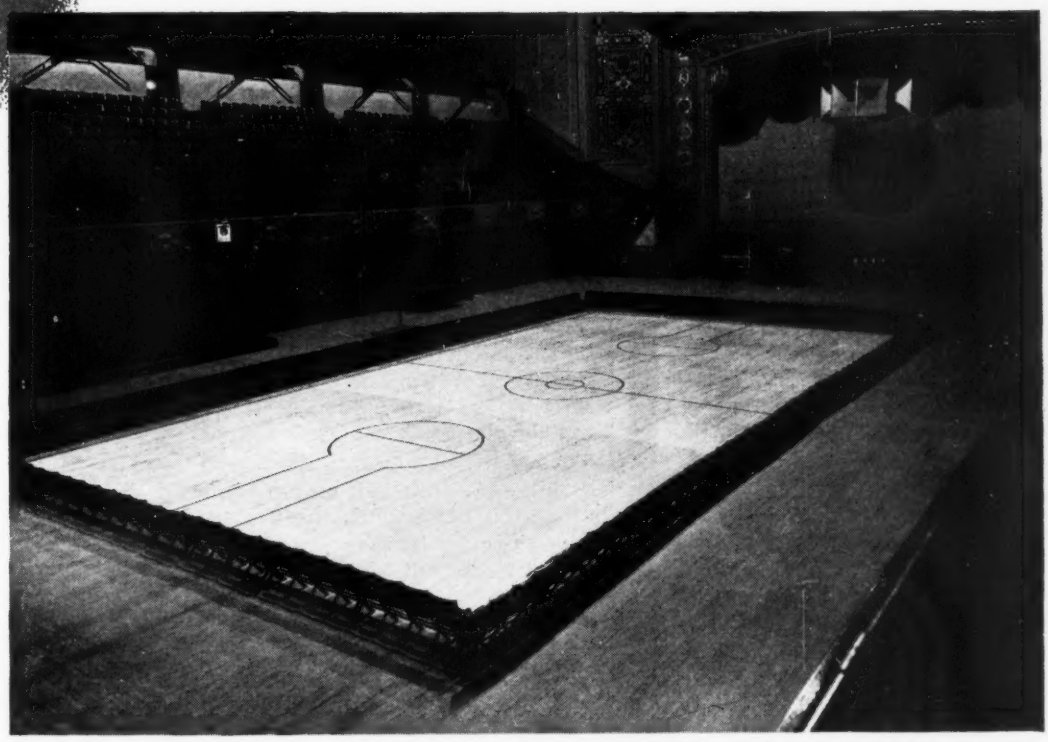

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racy of the throw may be improved by taking the ball in stride with the momentum going in the direction of the target. Hustling—fast starting and fast sprinting—will help place the fielder in a better position to make a more powerful and accurate peg.

It takes a lot of practice to perfect the delicate timing essential in getting under the ball, especially when you remember that on balls hit in front and to the side, it is often necessary to check the speed before taking the ball.

Unless the ball gets by him, the outfielder should throw directly to a base, using a low, line, one-bounce peg. The throw should be made overhand in catcher fashion. A fast, low, overhand throw will carry better and bounce more accurately into the hands of the infielder.

The main thing is to figure out the throw ahead of time. Before the ball is pitched, the outfielder should size up the situation and ask himself: "What will I do with the ball if it is hit to me?"

He should know exactly where to throw and, under all circumstances, make the peg without hesitation. A good rule, when in doubt, is to throw to second base.

KEY POINT IN INFIELD

It has been said that Babe Ruth never threw to the wrong base because he always pegged to second when in doubt. No young outfielder will ever look bad if he abides by the same rule. Second base is the key point in the infield, and alert second basemen and shortstops are nearly always in good position to relay throws to the proper bases.

Use of relays. Whenever a fly or ground ball gets by the outfielder, a different situation will prevail in regard to the throw. On balls hit to the right side of the outfield past the center or right fielder, the nearest fielder should go after the ball.

If there are fences to contend with, the next nearest outfielder can back up for a possible rebound. Meanwhile the second baseman should dash quickly into the outfield and line up with the play, which nearly always will be to third base or home.

Whenever the ball is hit past the outfielders into the left half of the outfield, the left and center fielder must give chase.

The one situation in which all three outfielders get in on the play is on the ball hit past the center fielder into dead center, especially when walls are present. In this situation, the shortstop goes out to serve as the relay man. He is the infielder nearest the play and is in better position to line up with third base or home.

FOR the past seven years, Carl E. Bolin has been directing the Ozark Baseball Camp for Boys in Salem, Mo. A three-month summer proposition, catering to more than 100 boys, the camp has been instrumental in sending about 50 boys into organized baseball.

Playing the hitters. A smart fielder will study the opposing batters and play them accordingly, depending upon their weaknesses and strengths, the situation, and the pitch coming up. The fielder can always improve his judgment on where to play the hitters by remembering where they hit the last time up.

In playing hitters on whom no line is available, it will help to bear in mind the place of the hitter in the batting order. If the opposing manager has done a good job, the third, fourth, and fifth men will usually be the long-ball hitters.

In other words, the outfielder should not play the lead-off, second, sixth, seventh, eighth, and ninth batters as deeply as the men in the middle of the batting order.

Young outfielders often make the mistake of always moving over toward the left-field line against a right-handed hitter and toward the right-field line against a left-handed hitter.

Against good batters, particularly pull hitters, this generally is sound baseball. However, the good hitters seldom, if ever, outnumber the poor hitters. Shifting to the right or left must, hence, also depend a great deal upon the speed and ability of the pitcher and where the ball will be pitched.

Keep in mind that many right-handed batters will hit inside balls to left field and that left-handed batters will hit inside pitches to right field. It is, therefore, important for the outfielder to know by signal (usually relayed by an infielder) where the ball will be pitched.

It should also be remembered that in most parks, the infielders get a great deal more protection from the sun and wind than the outfielders do. Fences, bull-pens, grandstands, tracks, and light poles furnish additional hazards. The fielder must be able to see, think, and act with split-second timing. Otherwise he isn't going to be of much help in the wide open spaces.

Fundamental Badminton

By KEN DAVIDSON

MANY beginning badminton players often start out by dismissing lightly any thought of learning the first fundamental of the game—the correct grips.

To correct a flaw after it has become a habit is harder than learning the right way but it can be done, with concentration and practice.

Speaking generally, there are only two kinds of Badminton strokes . . . the FOREHAND, which applies to any shot in which the shuttlecock is hit on the right side of the body and . . . the BACKHAND, used to hit the shuttle on the left side of the body, or across the body. If you play with the racket in the left hand, you will, of course, reverse all the instructions.

For the Forehand Grip, balance the narrow side of the racket on a table with the playing surface side at right angles to the table. Then place the end of the handle of the racket at the bottom of the palm of the hand — the end of the racket handle being next to but not touching the wrist. Close your fingers and thumb around the handle of the racket so that the "V" formed by the forefinger and thumb rests on the side of the handle in line with the narrow side of the head of the racket.

The racket handle should lie diagonally across the palm of the hand, and the fingers should lie along and around the handle. The fingers should not all be bunched together; the forefinger should be slightly apart from the other fingers at approximately a forty-five degree angle across the handle, as is the thumb on the opposite side of the handle.

Care should be taken to see that the "V" formed by the forefinger and thumb is kept in line with the narrow side of the head of the racket. Nearly 100% of untrained beginners have the "V" in line with the flat side, or playing surface side, which results in a restricted wrist action and a loss of hitting power, particularly from the back court.

The novice should stick strictly to the regular forehand grip which can be used for all forehand strokes no matter whether they are made at the front of the court or from the back line.

When held out at arm's length, the racket should continue in a straight line with the arm. If it sticks out from the hand at a ninety degree angle, you will find that the fingers are bunched together across the handle and that no space has been allowed between the forefinger and the other three fingers.

The fingers and thumb should hold the racket firmly but not tightly, otherwise the wrist and forearm muscles become tense and rigid. The hand and wrist must remain firm but free and supple at all times so that the maximum speed and strength can flow through to the head of the racket when it actually contacts the shuttle.

Gripping the racket in a "death" hold is a very common mistake and is the reason why many a 200 pound trained athlete gets very little speed from an otherwisely well hit smash —all the power of the body and arm stops in the rigid forearm and wrist. Consequently, the racket head moves forward at a comparatively slow pace for all the effort applied —or rather, misapplied.

On the other hand, many a female weighing 120 pounds gets the maximum speed from the racket head, correctly directed by a firm but supple movement of the hand and wrist, to hit crisply and cleanly a shuttle from one end of the court to the other.

Another common failing on the part of a novice is to grip the racket so that two or three inches of the handle juts out below the little finger. Some go so far as to place their forefinger up the actual shaft of the racket and use it more or less as a pointer towards the shuttle.

These errors greatly restrict the free movement of the wrist and creates a pushing action instead of a hitting action.

A mental hazard often seems to trouble some players, both novice and expert, whenever the word "backhand" crops up, but a proper backhand grip will materially help overcome such handicap.

Until the novice becomes accustomed to the flight and pace of the shuttle, he may find it easier to use the forehand grip for shots on the backhand side (with the arm crossing the body).

But, remember, ALL backhand shots, no matter what grip is used, are hit with the *opposite* side of the playing surface of the racket to that used for forehand shots. (The thumb should be on the same side of the racket as the hitting surface for all forehand shots and on the non-hitting surface side for all backhand shots.)

The backhand grip, as used by practically all the experts, is accomplished by letting the racket handle slide around slightly (upwards and away from the body) in the hand from the forehand grip so that all of the thumb is pressed against the side of the handle nearest you, with the tip of the thumb pointing straight up towards the head of the racket. The pressure of the thumb behind the racket provides added power and control.

This grip can be used effectively for all backhand shots hit in front of and level with the body. It also keeps the racket in a straight line with the arm, and gives the longest reach possible when the arm and body has to be fully extended to stretch for shots high and deep in the backhand corner of the court.

As in the forehand grip, the forefinger should be kept slightly apart from the other three fingers. If the fingers are bunched together, it causes the racket to stick out from the hand at a ninety degree angle and results in a *rolling* of the wrist

(Continued on page 20)

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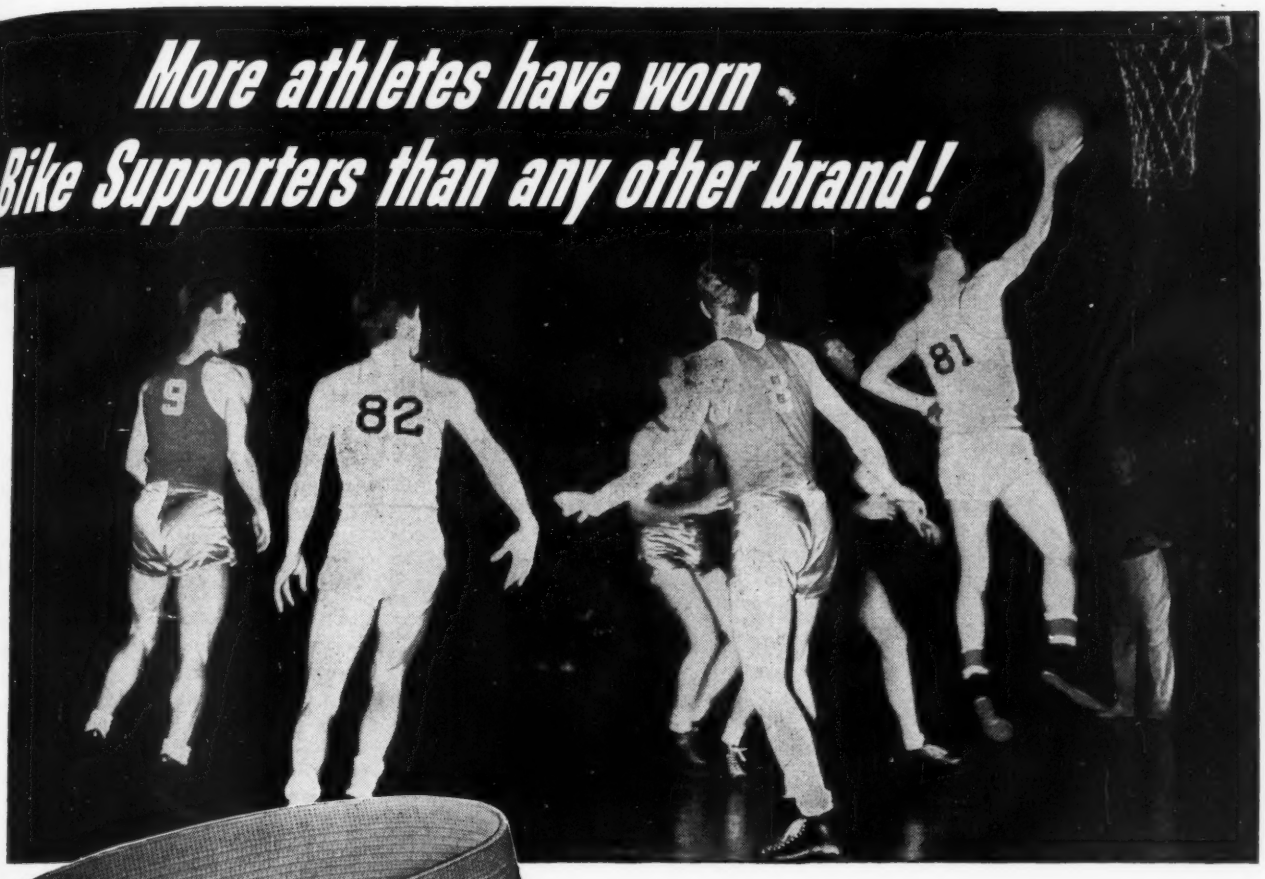

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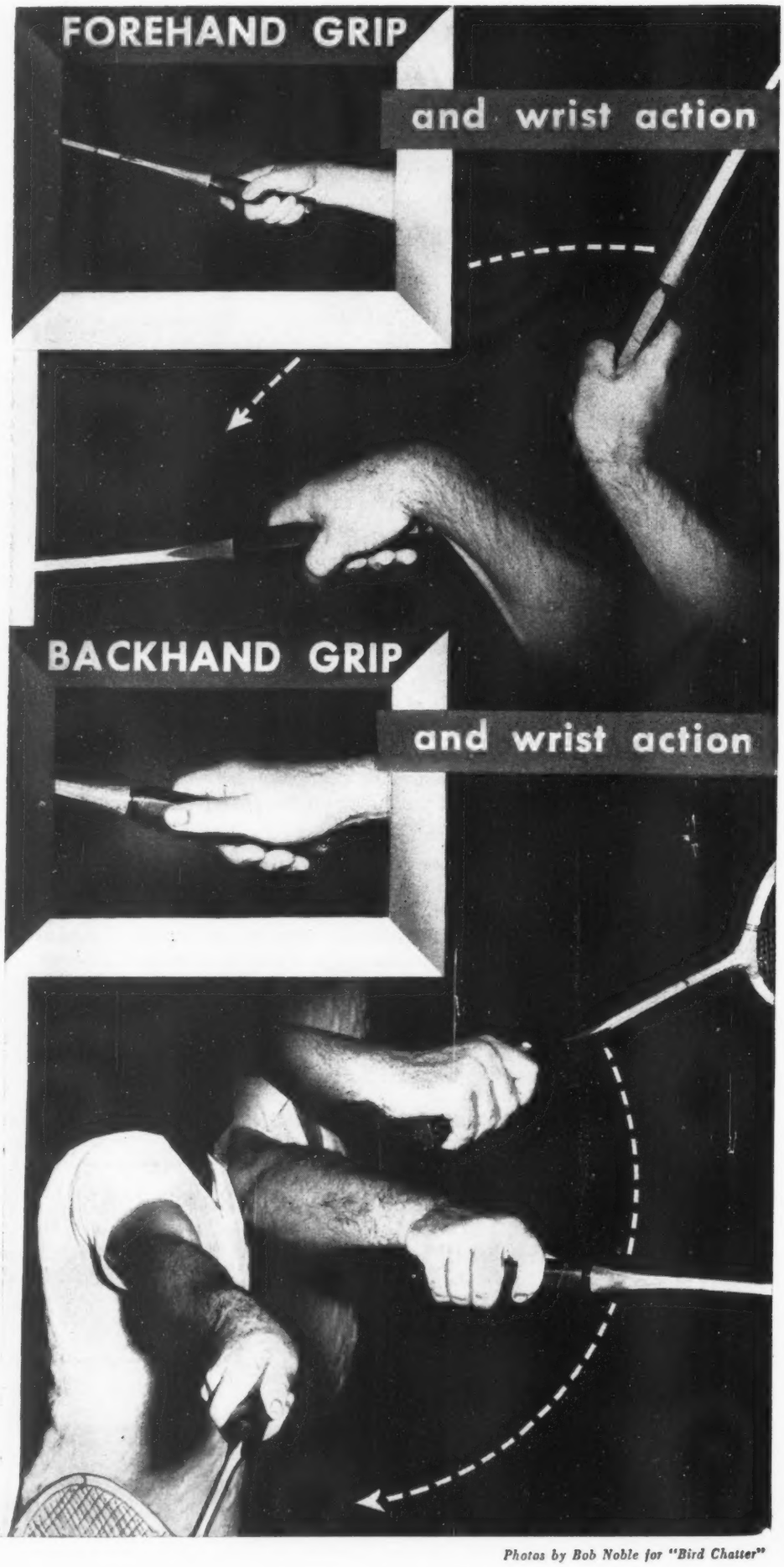
Correct Badminton Grips



Photos by Bob Noble for "Bird Chatter"

and forearm and fails completely to make use of any wrist snap.

If you allow your opponent to hit a shuttle past you and you have to make a backhand shot with your back facing the net, then the backhand grip with the thumb straight up the handle cannot be used and a grip similar to the forehand grip will have to be attempted. (On this particular grip the thumb slides a little down and more across the handle, as does the forefinger, and it will meet and rest against the top section of the middle finger.)

This modified forehand grip may also have to be used for *low* backhand shots near the net in order to obtain the steep angle of return required to get the shuttle up and over the net.

Some players feel that there is little time to change grips in a fast exchange of shots, but once a racket has been brought under control it becomes second-nature to change from the forehand grip to a backhand grip, or vice versa, as the racket is being taken back on the backswing.

SENSE OF TOUCH

On all grips try to develop a good sense of touch in the fingers—the forefinger, the thumb, and the little finger especially "feel" the position of the handle and direct and control the head of the racket in its contact with the shuttle.

Once this degree of proficiency is attained, a player may find it possible to improvise a hold in order to make a return from a difficult position. For instance, an extra two or three inches can be added to the length of the reach by allowing the end of the racket handle to slide up through the palm of the hand until only the forefinger and the thumb, with some aid from the middle finger, are holding the last inch or two of the handle.

Not much power can be generated by this irregular grip, but on some occasion when a point is urgently needed and the shuttle is not too far away from the net, it may be found possible to reach out and guide, rather than hit, the shuttle back over the net.

Or, in extreme cases, a backhand return might be made possible by allowing the handle of the racket to swivel on an axis formed by holding the sides of the racket handle between the middle of the forefinger and the middle of the thumb. The end of the handle leaves the palm of the hand as the three other fingers relax their grip and the head of the racket describes an outward arc which finishes at right angles to the

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arm. Although an amazing angle of return is possible, it naturally follows that there cannot be much strength in such a flimsy hold.

Needless to say, these and other extraordinary unorthodox grips can only be used by players of long experience and they should not displace the regular use of the normal forehand and backhand grips.

Some slight variations may occur in comparing individual grips, owing to the difference in the length of fingers, the width of the palm of the hands or the size of the racket handle used. But no player can hit the shuttle successfully unless he or she holds the racket in a firm, relaxed manner for all strokes from any part of the court.

The wrist is the connecting link between the racket and the rest of the body. It is a most important link, too, for the wrist provides the final movement in a series of movements which combine to make up a complete stroke. Each movement must be timed perfectly to get the best results but the proper use of the wrist will determine whether or not the stroke has power and crispness. A rigid or tensed wrist provides no impetus to the racket head, it merely acts as an extension of the arm.

Players who play with a rigid wrist, and they are legion amongst the ranks of tournament players as well as in the novice class, use a punching action with the arm, wrist, and racket kept in one straight line from the elbow. (These players wonder why their arms become tired.)

The wrist must provide some motion of its own.

The faster the racket head can be swung, with control, the more power you can put into your strokes—an important factor from the base line. The novice must first learn to cock the wrist back as far as possible.

On the forehand, the wrist bends backwards in the direction of the back of the hand and comes forward again bending inwards towards the palm of the hand. The wrist should be cocked backwards until the very last moment and only released a fraction of a second before the racket head actually strikes the shuttle.

Contact with the shuttle is made as the wrist (and racket head) straightens out, but there must be no *stopping of the forward motion* of the wrist at this point. As the wrist continues forward and bends inwards at the start of what is known as the follow-through, the racket head will go ahead of the wrist and arm for the first time in the complete stroke.

On a full swing on a forehand stroke, the wrist will bend almost

THE most versatile badminton pro extant, Ken Davidson has starred on stage, screen, television, and lecture platform, and has just been appointed coach and manager of the first U. S. badminton team that will tour Britain for the Thomas Cup International Championships and the All-England Tournament. Mr. Davidson is also the badminton-equipment supervisor for the General Sportcraft Co. and author of several texts. His article appeared originally in "Bird Chatter," the official badminton magazine, and is reprinted here with the permission of Mr. Davidson and editor Robert Kildall.

180 degrees from the beginning of the stroke to the completion of the follow-through. The degree of bending may diminish somewhat as less power is needed for shots nearer the net.

The bending back of the wrist and its bending inwards on the follow-through should be present on ALL strokes, even on the most delicate of net shots which are played within an inch or two of the top of the net. For these shots of fine touch, the wrist must remain firm and supple and not dangle loosely, thereby "babying" the shot.

Many tournament players fail on this particular stroke, after they have positioned the body and extended the arms perfectly, because they hold their wrist still (not necessarily rigid) and offer a "dead" racket to the shuttle. However slight it may be, there must be some forward motion of the wrist for these close net shots.

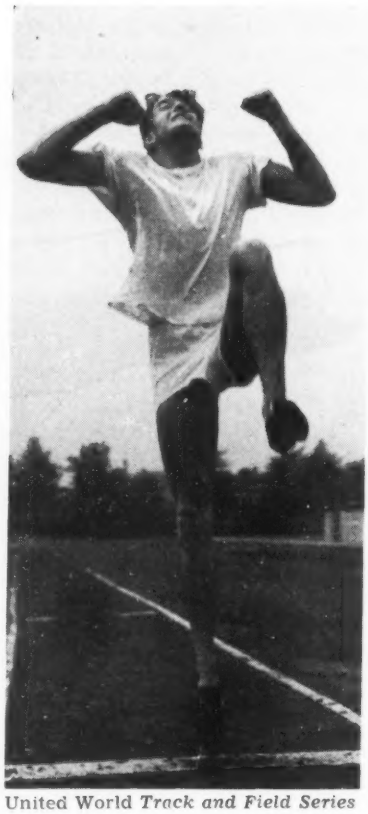
If the forehand grip is retained for use on the backhand side, the wrist action is just the reverse of the normal forehand wrist movements—with the wrist being inwards first (on the backswing) and then outwards on the follow-through.

The regular backhand grip, with the thumb placed straight up the handle, has a different wrist action. The wrist bends sideways. It moves towards the thumb side of the hand on the backswing, and is then released forward towards the little finger side of the hand on its way to contact the shuttle and the consequent follow-through.

Although the wrist can only be bent half as much sideways as it can backwards, the slight loss in distance is greatly offset by the extra snap imparted by the pressure of the thumb which is behind the racket

(Concluded on page 47)

The Right Man The Right Event



United World *Track and Field Series*

By W. HAROLD O'CONNOR
CONCORD (MASS.) HIGH SCHOOL

YOU'RE a high school track coach and you have just issued a call for candidates. Last year's championship team is gone and you are grumbling a bit as you envision that swell hurdler you developed elevating the prestige of some college coach.

Perhaps you find yourself, as I do now, with but a single letter man and a few boys who have had little more than a baptism of track experience.

You look about you and see a conglomeration of prospective stars with only vague ideas about their desired events and little or no ideas of their abilities in any specific events. You list them as dash men or milers, jumpers or weight men, according to their wishes or your own impressions.

You may grin a bit when that wisp of a freshman informs you that he expects to run the mile, but you remember sheepishly how you've been fooled before, so you list him as he suggests.

A sophomore who tips the beam at 150 reports that he wants to become a shot putter, and you hesitate a moment before you recall that Matteodo of Hope High School in Providence, R. I., weighed about 155 and chucked that iron ball out there about 54 feet. You think again so you list the boy under shot putters.

Then you look at the 25 or 30 remaining candidates or at the 125 or 130 if you coach in a large high school, and you ask yourself "Where, oh where, will I place them?"

I used to stand before strange new groups and wonder the same thing. The more I worked at the business of coaching track, the more dissatisfied I became with the hit-or-miss methods of placing boys in the various events. I wondered if there were any methods by which the candidates could be screened and placed in the events in which they had the best chances for success.

I realized that boys who see no definite signs of success or, at least, of progress, are apt to become quickly discouraged and drop from the squad. That always bothered me because I always wondered if one of those sprinters who dropped out might not have been the 4:40 miler I wanted.

I looked about for some tests I could administer without too much difficulty and which would help orient the misfits before they discovered the futility of their efforts and quit the squad.

The following group of tests furnished the answer. They have helped me and probably can help you. Some of them have been used on hundreds of candidates the past few years.

First I like to test my candidates purely for speed. To proscribe any need for endurance, I make the distance to be sprinted very short —just 30 yards.

Until recently, I had been using a bunch start, but I found that this did not give me exactly the information I wanted I noticed that several of the boys who seemed very fast off the mark were being quickly overtaken by other boys toward the end of the 30 yards. Hence I felt that I was not getting a true picture of the boys' natural sprinting ability.

A track clinic at Tufts College gave me an idea. Coach Sweet of New Hampshire U., in talking about speed testing, suggested that the athlete be tested over a 30-yard course *after* being allowed a short distance to pick up full speed. He stated that he had been using this test with good results.

When I got back to my squad I tried out the idea, and I now believe that my original test plus the running start test may answer plenty of questions. The boys who record the best times from the crouch start will usually make your fastest starters. Their natural speed can then be checked through the 30-yard test with a running start.

Instruct your candidates to try to pick up full speed by the time they reach the starting line and to sustain their speed over the 30-yard course.

These tests can be a big help in selecting the 100-yard men. The boys who rate highly in both tests represent your most likely sprint prospects, even though they may fancy themselves as shot putters or milers. Once you have determined your sprinters, the speed tests may be used to screen possible candidates for the quarter mile, half mile, mile, and even certain field events.

In choosing men for the longer distances, however, you must be guided by more than natural speed. Endurance now becomes an important factor. Boys selected for these events must be able to carry speed over distance. This means that new tests must be introduced.

The Schneider Test appears to have some value. Once you have uncovered your speed merchants, you can, by putting them through the Schneider, learn their physical condition. I am inclined to think that this test is helpful, too, in screening candidates for distances from the 440 up.

After determining your men for the 440 and 880, you must consider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the mile. The pulse rate test quickly indicates those boys whose rate is in the 50's or even below. While the correlation of this test has not yet been proved, the fact remains that most of our truly great distance men have possessed unusually slow pulse rates.

In my work with Johnny Kelly, national marathon champion, I have noticed something of additional import. I refer to the remarkably quick recovery time of gifted distance runners.

I have been intrigued by this point for some time, and lately I have been checking my boys for this characteristic. This year I have a little freshman who seems to possess these characteristics to an above-average degree, and another boy who does not check so well on these points. Both are very interested in track and I am following their progress closely to see what I can learn about the factor of recovery time as an aid in screening distance men.

Hurdling and broad jumping, as well as pole vaulting, also involve the element of speed plus a high degree of coordination. This means another combination of tests.

I have noticed that boys who combine the ability to sprint with the ability to broad jump, represent the most likely hurdle prospects. Height also is worthy of consideration. In fact many coaches consider a combination of high jump and sprint ability a good indication of hurdle ability.

I am not so sure of this. True, those old leg muscles must have spring; but, since we do not stress height over the hurdles, I wonder which ability—height or breadth—furnishes the better index. To me, the jump giving forward momentum seems more reliable.

When your boys are completely inexperienced, as mine are this year, you may not be able to screen your hurdlers with the broad jump test. This may particularly apply indoors. A quick test that will tell you something about spring is the Jump-Reach.

The procedure is simple.

Have your prospect stand near a wall facing sideways. Let him take a short piece of chalk or dip his fingers in chalk dust. Then have him reach upward as high as he can and mark the wall. Next have him crouch and spring as high as he can, making another mark on the wall.

After he has tried this a couple times to get the idea, test him. Measure the distance between his reach mark and his jump mark and you have an actual measurement of his spring. By screening your squad this way, you can pick out your best possibilities for the high jump and also get some idea on whom to test for the necessary speed in the hurdles and broad jump.

A SCHOLASTIC COACH contributor of long and unimpeachable standing, W. Harold O'Connor coaches the fine track teams at Concord (Mass.) High School. As this article clearly shows, Coach O'Connor's contributions are particularly noteworthy for their exploration of subjects off the beaten path.

I have a 6-foot freshman this year who rates quite well in the jump-reach test, but who has no speed. Since speed is no factor in high jumping, I have started him in the high jump. He is young and extremely awkward, but I hope to follow through with him in this event because he is very interested. At first he had difficulty clearing 4', but he has just done 4'10" after about three weeks' training.

My other jumper, a senior, is now doing 5'3" after three weeks, but I do not expect to see him go higher than about 5'5" or 5'6" because he lacks the spring I find in the freshman.

In checking your potential shot putters, do not overlook the importance of speed. Size alone does not make a good shot putter. Speed across the circle is very important, and coordination is a *must*.

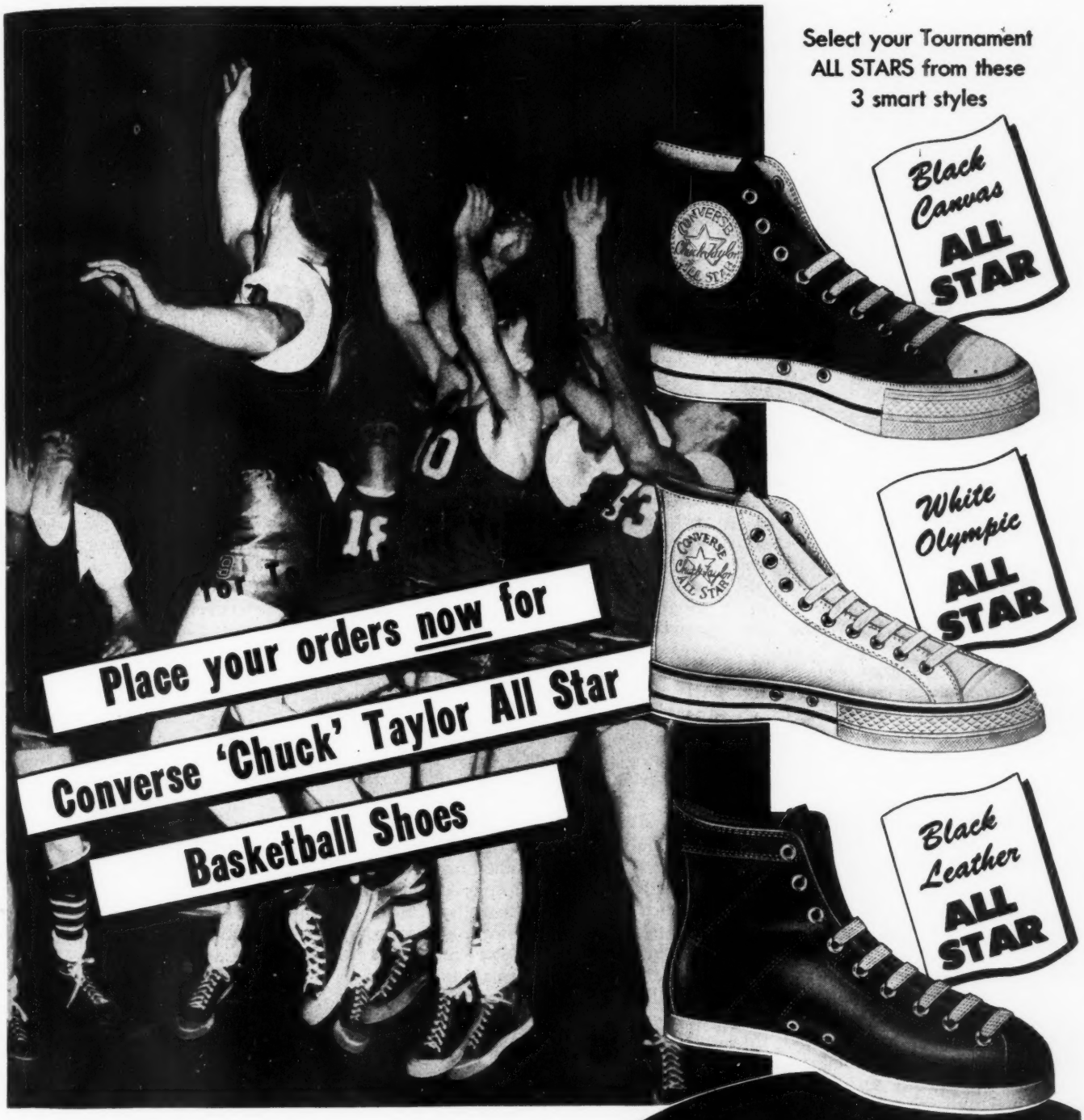
How to check for coordination? I have fooled around with several ideas, but none of them seems to fill the bill too well. I have had to resort to the old reliable Burpees. They seem to be about as accurate a measure of coordination as any that I can find. The ability to do a better than average number of Burpees in the time allotted is a good coordination index.

The test should be carefully supervised to see that each boy performs the Burpee in the correct manner. A 30-second period is a good one to use. Ten Burpees are about normal for that period. Those able to do up to 15 give evidence of very good coordination.

This test is valuable for the selection of high jumpers, broad jumpers, pole vaulters, and shot putters. When used with the speed tests and the jump-reach test, it can be very helpful.

Since this is the first time in years that I have been forced to start my season with a completely green squad, I have an opportunity to place the candidates for the various positions in accordance with the results of my testing program.

(Concluded on page 39)



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Track Stimulant for the Small High School

EACH spring the high school coach, after fielding teams in football and basketball, turns tired eyes to the problem of developing a well-balanced track and field team.

This job is tougher than the casual spectator realizes. Almost all the events call for a high degree of coordination and few high schools, especially the smaller ones, are blessed with many boys who possess it.

At King City High School, we have adopted an all-year plan which helps in developing the material on hand, uncovering new material, and creating interest, in addition to imparting a knowledge of track to all boys attending school.

This plan can be incorporated into your gym classes, intramural program, and interscholastic schedule without overworking the students or taking too much time from your carry-over recreational project.

We are sold on our plan because it produces results without requiring extra facilities or adding substantially to the budget—and the budget is generally the greatest drawback in setting up a new program in a high school curriculum.

When school opens in September, we waste no time getting our plan started. We begin working on coordination through a touch-football program.

Along with the football fundamentals, we teach all forms of relay-racing in order to develop correct running form and increase wind and endurance. After this we go into tumbling and gymnastics, which not only aid the vaulters, weight men, and jumpers, but improve the general strength of the average student.

Each class is given 15 minutes of organized calisthenics before each instruction period. Meanwhile, we screen the men interested in cross-country, and select a cross-country team from each gym class.

We match these teams against one another until all have received an adequate background of competition. When they are ready, we schedule an inter-gym cross-country race among representatives from each gym class. From this group, the four class athletic managers choose their class teams, which run the following week in an inter-class meet.

We conclude our gym-class cross-country training with the annual King City Turkey Trot, in which the first three men are awarded, respectively, a turkey, a chicken, and a duck.

From these contestants we select our varsity school team. Even if there are no schools in your league with cross-country teams, this intramural program still has much to offer you. It develops runners, provides the experience of working under pressure, and creates interest in an otherwise monotonous sport.

As the gym classes tire of football, we begin our basketball and volleyball schedule, which is built around coordination exercises, ball-handling, dribbling, passing, and running. All these drills help greatly in the development of hurdlers, jumpers, vaulters, and weight men.

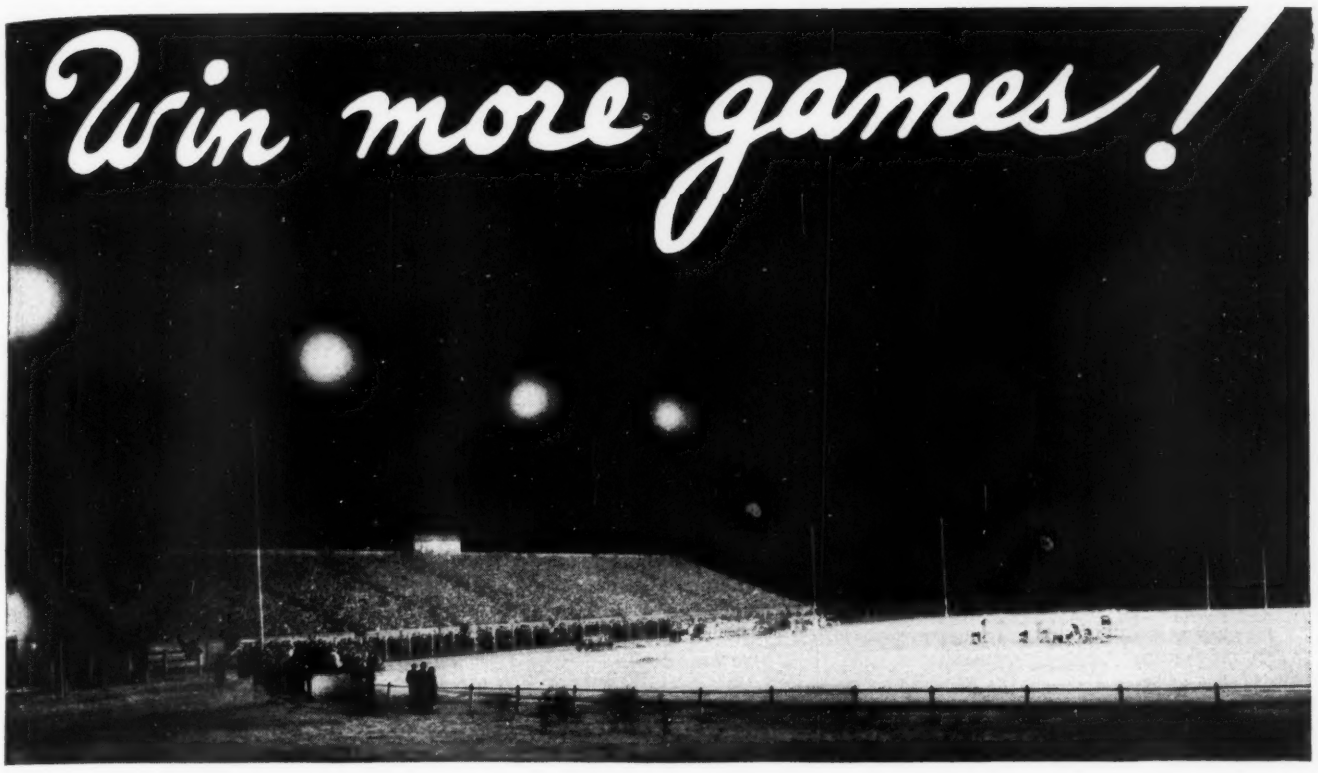
At the same time we carry on competitive high and broad jumps, as well as a split-vision and coordination testing program. This has helped make real jumpers out of mediocre athletes.

When spring comes, we are ready to start our regular instruction in track and reap the results of our training plan. During a period of six weeks, each track and field event is discussed, explained, and demonstrated, with special attention being paid to the freshmen.

Each member of the class then

By E. O. FISCHER
Coach, King City (Cal.) High School

United World *Track and Field Series*



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proceeds through the correct form, and is aided in perfecting his technique by the constructive criticism of the coach and the other students. As each event is completed, a written and practical examination is given, with the results posted, so that each student may know his relative standing.

The next step is to divide the class into two teams, to compete against each other in the following events: 100-yard dash, 440-yard run, 1-mile run, 70-yard high hurdles, 120-yard low hurdles, 440-yard relay, shot put, discus, high jump, pole vault, and broad jump.

The gym classes are then matched in a round-robin schedule to determine the top athletes in each event.

At this point in our program, with the enthusiasm high and the competition keen, we hold the Inter-Gym Relays, with students from each gym class, divided into lightweight and heavyweight sections, competing in these 10 events:

1. 480-yard shuttle relay (4 men each run 120 yards over 5 low hurdles 20 yards apart).
2. 280-yard shuttle relay (4 men each run 70 yards over 5 high hurdles 10 yards apart).
3. 440-yard sprint relay (8 men each run 55 yards).
4. 880-yard relay (8 men each run 110 yards).
5. Medley relay (men running 110-220-440-880).
6. Broad Jump (best 4 men from each class, distance totaled).
7. High Jump (best 4 men from each class, distance totaled).
8. Pole Vault (best 4 men from each class, distance totaled).
9. Shot Put (best 4 men from each class, distance totaled).
10. Disus (best 4 men from each class, distance totaled).

The results of this event are posted, and the four class athletic managers again select their teams to compete in the Inter-Class Relays, composed of the same ten events listed above.

By this time our varsity track and field squad is beginning to take shape. The following week we hold our Inter-Class Track Meet, which consists of all the events on the regular track schedule. All athletes who qualify for this meet and who show interest in track and field are urged to go out for the school team. This plan enables us to get about three-fourths of the boys out for track—quite an achievement.

With such a large group to instruct, and, as always, with insufficient time to cover everything, we encourage our veterans of past seasons to help us teach techniques and strategy to the inexperienced. This procedure also gives the veteran training in leadership, and helps to promote team spirit. Visual aids are used both to create interest and teach techniques more completely and rapidly.

The development of any skill comes only through extensive participation in that activity. In order to give more men a chance for competition and to give the border-line men more individual attention, our first two or three track contests are more than just dual meets; they are dual relay meets, composed of 13 events:

13-EVENT RELAY MEET

1. 480-yard Shuttle Hurdle Relay (4 men, 120 yards each, 10 high hurdles).
2. 480-yard Shuttle Hurdle Relay (4 men, 120 yards each, 10 low hurdles).
3. High-Jump Relay.*
4. Two-Mile Relay (4 men, 880 yards each).
5. Pole-Vault Relay.*
6. Sprint Relay—440 (4 men—110 yards each).
7. Discus Relay.*
8. Mile Team Race.**
9. Broad Jump Relay.*
10. Half-Mile Relay (4 men—220 yards each).
11. Shot-Put Relay.*
12. Distance-Medley Relay (440, 880, 1320, 1 mile).
13. Mile Relay (4 men—440 yards each).

*(Each school enters four men in each of the five field events. In the trials, the best performance of each member is recorded, then added together for the team's score in that event. The team which has the greatest total distance or height in each event is the winner of that event.)

**(The mile race requires at least four entries from each school, but as many others who wish to enter may do so. It is scored as for an ordinary cross country run: The first man to finish counts one point; the second, 2 points, etc. The team which scores the lowest total on the first four men to finish, wins. Those who rank fifth, sixth, etc., for their group are not recorded, as they do not score points for their team.)

These Dual Relay Meets cannot result in a tie, as they are made up of 13 events in all, and the team which wins each event scores one point.

With two or three dual relay meets under our belts, we jump right into our league schedule, ending with our conference and sectional meets.

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By HURON J. SMITH and MORTY MORRIS

Foul Shooting Drill

FOUL-SHOOTING practice, to most basketball players, is a tedious, monotonous routine. Some coaches have their boys shoot 50 or more fouls a day before practice. Other coaches insert their foul shooting at the end of practice.

In either case, the boy will plant his feet in a single position and shoot 'em up one after the other.

At best, this is humdrum stuff and it hasn't even the blessing of practicality. How much good can a boy get out of stepping up to the foul line completely fresh or completely pooped, and shooting rapidly under no pressure, when in a game he will take his shots at sporadic intervals when fatigued and under pressure?

Do you wonder why most foul-shooting practices degenerate into hurried and careless exhibitions with the boy interested only in finishing as soon as possible?

What is called for, it seems, is a drill which affords many shots from the foul line, keeps interest high, keeps the players moving, and simulates actual game conditions.

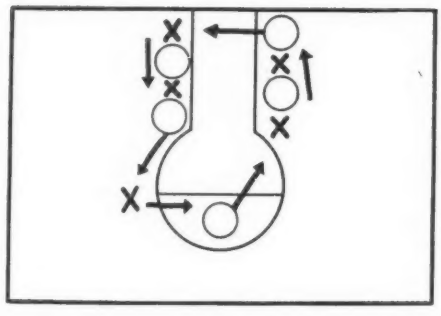
After much experimentation, the authors settled on the following drill as best serving the purpose.

We divide ten men into two evenly balanced teams, wearing different colored jerseys. One man starts at the foul line while the others assume alternate positions along the lane as in a regular game (see diagram).

If the shooter makes his first shot, he is entitled to a second. If he also sinks the second shot, he moves one notch counter-clockwise. The man originally on his left shifts to the foul line and the ex-shooter takes the first position on the right side of the lane.

This keeps the players alternating positions and assures each team of a shooter on every other lineup.

If the first shot is missed, the ball stays in play on the half court until either a basket is scored or the



ball is thrown out of bounds or tied up.

In any of these events, the players return to the foul area with each moving one position to his right, thus placing a new shooter on the foul line after each short scrimmage.

If a player misses his second shot after making the first, the ball still goes into play as before.

This drill not only develops foul shooting under typical game conditions, but also incorporates proper play procedure and actual experience in free-throw situations.

The player at the head of the foul line knows he must block the shooter by stepping into the lane in front of him when the ball strikes the rim. As he steps in to cover, he calls his play to the rest of his team, eliminating any possibility of confusion and assuring protection against follow-ups by the shooter.

The player under the basket must step into the lane to protect his inside position, and times the rebound so that he gains possession at the peak of his leap. If a teammate is shooting, the jumper attempts to rebound the ball into the hoop.

The man second in line must conspire to gain position on the opponent in the desirable spot under the board. Each player along the lane must also judge the rebound and attempt to gain possession in the best and easiest manner.

If the ball is lost, the team placed on defense must learn to locate the opponents quickly or pick up the first available loose man or to drop at once into a zone, according to the defense employed by the team.

So that the importance of the foul shot is not obscured by the added reward for a field goal, we score one point for every successful shot, regardless of whether it is scored from the floor or from the foul line.

Since each man plays every position while rotating about the floor, he gains experience that would otherwise be impossible. He learns how to handle himself at the foul line (where we stress making the shot first and concentrating on the next play afterwards), under the basket, covering the shooter, and at the intermediate positions.

He shoots while exhausted, in the excitement of play, and under pressure. He must not only concentrate on the shot but must be alert to enter active play. He does not fall into a sloppy, careless routine embracing no change of position; and he is moved by both the desire to play, to score, and to win.

To make sure each boy gets enough free-throwing practice, we supplement this drill with some conventional shooting practice.

A chart listing the names of all the players and the number of times they had to shoot to complete their daily quota of 20 conversions, is kept on the locker room wall. In addition we display on a permanent bulletin board the names of the players who hit for 15, 20, 25, etc., in a row.

We record each player's free-throw statistics for every game, and post a list of both team and individual percentages after every game.

All this stresses the value of foul shooting and stimulates interest. We also run a foul-shooting contest every year, open to the entire school, with awards going to the winners and runners-up.

Huron J. Smith and Morty Morris composed this piece while co-coaching basketball at Attica, N. Y. Smith has since become director of athletics at Genesee Junior College at Lima, N. Y., and Morris has moved to Portville, N. Y.

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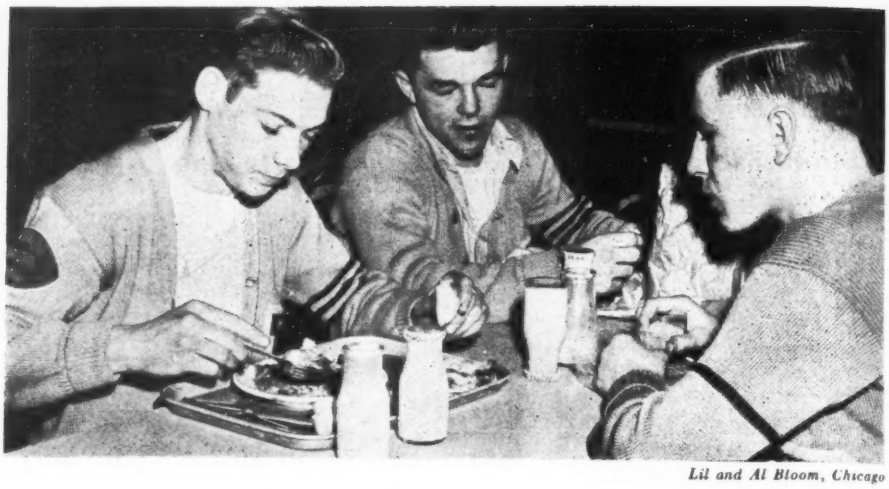
The Athlete's Diet



Lil and Al Bloom, Chicago

THE diet of the high school athlete hardly differs from that of any other normal adolescent. Being an athlete, he probably possesses a solid healthy frame with a good covering of muscle tissue.

But his daily routine is more strenuous than that of his classmates; and the rigid practice schedule and the competitive contests necessitate his being even more careful about his diet and hygienic habits.

The first obligation of any coach, particularly in the high school, is to make sure that his players are organically sound before exposing them to the long grind of training and competition.

The health service division of the high school will arrange for a qualified physician to perform this duty. When there is no health service division, arrangements should be made by the coach or the principal to have some physician do this work.

Unless the coach possesses a physician's license, he should not under any circumstances, be the final authority in determining the boy's fitness for participation.

The presence of the coach at the medical examination will aid him in obtaining the health status of each player and to discuss with the physician any possible limitations or disablements. The recommendations of the physician should be followed implicitly.

Provision should also be made for the recording of each boy's weight during the season. Weight varies throughout the day; so, as far as possible, it is a wise idea to have the weights taken at the same time each day, preferably in the nude or in clothing of known weight.

A well-nourished boy should grow, and that growth may be used as an index of the normality of his nutrition and other health practices. Comparison need not be made with standard charts, but with the boy's own growth over a period of time.

Prolonged stationary weight or failure to make satisfactory gains over a season's time indicate the need of a physical re-check. The coach should curtail the severity of the work given the boy, check his hygienic habits, and last but not least, check his diet. During the season, the coach should be particularly alert to observe signs of nervousness, restlessness, irritability, fatigue, and any other abnormal reactions. These symptoms may be the harbingers of an oncoming illness. A few days rest or an immediate medical check-up may correct the defect in time.

GENERAL DIET

There is no special "wonder food" or fortified pill for athletes. Surprisingly enough, athletes should eat what everybody else eats, but with few exceptions. If the boy has satisfactorily passed the medical examination and possesses the "heft" and ability to make the squad, the chances are that his parents have done a pretty good job of feeding him correctly.

Your job is to see that he stays that way; that you do not take so much of his time that he neglects his school work; and that you do not work him so hard that he is too tired even to eat.

By DR. HENRY F. DONN

The functions and sources of the various nutritional essentials were presented in a previous article, *The Schoolboy's Diet* (December issue). They need not be repeated here.

The fulfillment of the nutritional needs by the use of natural foods is the only approach to sane dietary practices. The prescribing of vitamin pills, calcium pills, and any other special nutritional aids is the responsibility of the physician and not of the coach.

Few coaches have full control over the diet of the players on the squad. Where he does have full control, he is usually assisted by a trained dietician

Coaches in public schools are not quite so fortunate. If the school is in a metropolitan area, you'll usually find boys of many nationalities on the squad; boys whose parents have definite ideas on dietary practices.

Most parents are deeply concerned with the eating habits of their sons, and would welcome any suggestions from coaches or school health authorities on ways to improve the eating habits of their children.

People can live healthfully on different diets as long as the diets contain the basic ingredients needed by the body. It makes little difference in what form the needed elements are taken.

For instance, protein-producing foods so necessary for the building and repair of muscle tissue may be expensive in the form of meat; but the protein requirements of the body can just as efficiently be met with beans and other less expensive protein food.

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BREAKFAST

An athlete should awake early enough to allow sufficient time for a leisurely breakfast. If he awakes too tired and with the feeling of not having had enough sleep, he should allow more time for sleep or cut down on the strain of strenuous practice.

Breakfast should be one of the biggest meals of the day for the athlete, particularly if he brings his lunch to school. During the early part of the season, especially in sports like football and basketball, the player will usually get home just in time for dinner and may be too tired to do it full justice.

Fruit, either fresh or in the form of juice, or tomato juice; whole-wheat toast of fortified bread; a whole-grain cereal, sugared to taste, hot or cold; one or preferably two eggs, any style except fried, seasoned with iodized salt; and at least one glass of fortified milk; comprise a good breakfast for the high school athlete.

There is enough variety in fruits, cereals, and protein breakfast foods to cater to the tastes of the individual. Milk may be flavored with ovaltine, malt, or any other acceptable flavors. A breakfast of this type should "hold" the average boy until he returns home for lunch or eats it at school.

Walking to school will provide leisurely exercise and fresh air to aid in the proper digestion of the breakfast.

LUNCHEON

If the school is fortunate enough to have a lunchroom, the players should be encouraged to eat there. In all likelihood, the meals will be scientifically prepared and will provide sufficient variety to cater to individual tastes. Boys who bring their own lunches might supplement them with a bowl of soup, preferably vegetable.

Lunches from home may contain two sandwiches of either meat, fish, beans, or eggs, made with whole wheat or fortified white bread; a piece of fresh fruit; lettuce, celery heart, or raw carrot; and at least one cup of fortified milk. Ice cream or candy may be used as a dessert.

Soda pop, coffee, tea, or alcoholic beverages have no place in the diet of the high school boy or athlete.

If the meal is purchased, it should contain a vegetable or meat soup; meat, fish, eggs, or beans; two vegetables, one of which is green; milk; ice cream or fruit; and, if necessary, a piece of candy. The meal should be eaten slowly.

Many coaches make it a practice where lunchroom facilities are available, to have training tables set up for members of the squad. When possible, the coach will eat with the boys. In this way, he may check on what the boys are eating and, at the same time, help build up a spirit of fellowship.

DR. HENRY F. DONN will be remembered as the author of the superb series of hygiene articles which ran from October 1946 through September 1947. His current contribution is the second of two articles on the vital problem of diet. The first appeared in December. Dr. Donn received his doctorate in hygiene at New York University, and is now a coach-physical education instructor at Weequahic High School, Newark, N. J.

AFTER-SCHOOL SNACKS

It seems hardly possible that, after "stacking away" two good meals, a high school boy will feel hungry after school. However, it is not unusual for adolescents to have prodigious appetites. An adolescent eats more than an adult, for he must take care not only of the requirements for active living but for the growth process as well.

The average high school athlete, being more active physically than the usual teen-ager, needs more food.

Some coaches provide oranges or other fruit, or a glass of milk with some cookies for the players on their squad. Others are not averse to the boys eating a bar of candy before practice, preferably chocolate. However, snacks should not be taken if they interfere with the eating of wholesome food at the evening meal.

After practice or afternoon competition, the coach should insist that the players return directly home and not loiter at one of the local stores or corners, particularly if the boy is tired. He should get home and rest for at least a half hour before eating his dinner.

DINNER

Fatigue and emotional upset are dangers to guard against before partaking of the evening meal. Anger, pain, worry, and fatigue may delay digestion. When stomach di-

gestion is delayed, bacteria and acids are likely to cause fermentation of the starches and sugars, producing gases which may cause distress.

If the boy has had a particularly hard afternoon, it would be wise for him to postpone eating for at least an hour.

The supper should be light: soup, with crackers; a salad; a small piece of fish, meat, or other protein food; a baked potato; milk and a fruit dessert. Before going to bed, if a boy feels hungry, a glass of milk or a piece of fruit or candy may appease his hunger. A cup of warm chocolate may also help him relax.

One should not eat too much before going to sleep. The digestive system needs a rest as much as the rest of the body.

SPECIAL CONSIDERATIONS

On the day of athletic contests, the breakfast of the high school athlete should be heavier and his lunch limited. Many coaches want their boys to play on an empty stomach.

This is sound physiological reasoning. When the stomach contains food, the athlete is apt to suffer nausea and vomiting upon strenuous muscular exertion or strong emotional feeling. This is particularly true in track, swimming, and basketball.

In practice sessions or games which produce profuse sweating, water should be sipped if needed. Preferably, it should be used just to wash the mouth out. If the player finds it necessary to drink, he should supplement it with the taking of a salt tablet.

In profuse sweating, the body loses a considerable amount of salt, thus interfering with the body chemical balance. Too much of an unbalance may cause a boy to suffer stomach cramps.

Normally, water should be drunk as often as desired unless the athlete needs to lose weight; then, it should be curtailed as much as possible. Water should never be used to wash down unmasticated particles of food in the mouth. This interferes with important digestive processes in the mouth.

Coaches insisting on the elimination of fried foods and the curtailment of rich pastries during the season are not without physiological backing. Gastric digestion in the stomach chiefly affects proteins, preparing them for additional digestive processes in the intestines.

In the stomach, there is some digestion of emulsified fat, like cream. Generally, fat is digested in the

small intestine. In the presence of excess fat, a fatty film is formed around the masticated proteins in the stomach and interferes with their proper digestion.

Many coaches feed their boys chocolate, honey, sugar, or other high carbohydrate foods between the halves of a game or before a contest. While it is true that with the exception of chocolate, these carbohydrates are quickly digested and absorbed in from 10 to 30 minutes for use by muscle tissue, it is also true that during exercise, the amount of blood to the skeletal muscles increases and the supply to the stomach decreases.

Hence, it is not uncommon for boys who have eaten any type of food before or during a contest, to lose the contents of their stomach or suffer from cramps.

It is not wise to set up hard and fast dietary rules for the high school athlete. Allow the players plenty of latitude. The important thing is to have them get the protection foods containing vitamins and minerals and protein.

People have likes and dislikes with regard to food. A boy can become emotionally upset if he is made to eat something he doesn't like. Physiological disturbances called allergies may occur in many boys when they eat certain foods. Generally, the boy knows which foods he is allergic to and will avoid them.

Proper care of the digestive system involves continued adherence to the hygienic practices of adequate sleep, sufficient rest, adequate exercise, sufficient exposure to sunlight and fresh air, the avoidance of disease, proper and natural elimination, the avoidance of tobacco and alcohol, and, emotional stability.

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SOUTHERN DISTRICT CONVENTION

THE annual Southern District Convention of the Health, Physical Education and Recreation Association will be held in Asheville, N.C., on February 23-25.

Guest speakers include: Dr. Carl Troester, executive secretary, AAHPER; Miss Mary Titus, department health education, N.E.A.; Dr. Fred Hosler, superintendent of schools, Oklahoma City; and Dr. C. N. McCloy, University of Iowa.

The planned entertainment will feature an informal reception and dance, a smorgasbord dinner, square and social dancing, and demonstrations.

Each member is expected to make his own reservation directly with the hotel of his choice. Headquarters will be set up at the Battery Park and George Vanderbilt Hotels.

Right Man, Right Event

(Continued from page 26)

Since all the positions are wide open, the boys are not faced with the need of beating out any so-called stars. They are responding well to my suggestions and they have entered into the experiment wholeheartedly. Since the results have already been somewhat favorable, the squad is more than ready to make any shifts I may think advisable.

I am keeping close data regarding their progress, and I have attempted to regulate their training programs to fit their individual needs. None of the data so far points to any member of the squad as a possible national or even sectional champion. But I have two freshmen whose tests indicate possible state championship stature before graduation; two sophomores who give strong indication that they will be champions in our class before graduation; and one junior whose ability according to the tests is enough to warrant the belief that he will score in our indoor title meet.

I noted five other boys whose tests suggested that they would be frequent scorers in many of our dual meets. To date, we have had two dual meets; both with larger schools. We have won both meets, and in each meet both the freshmen have scored. My sophomores have each scored in one meet. The junior has won his event both times and also has run a fine leg of a winning relay in each meet.

Among the remaining five who scored well in the tests I have one senior who has won his event in both meets and also run a good relay leg. One junior has scored in both meets although he has not yet won one. Another junior who tests well but lacks confidence, has a first and a second to his credit. A third junior boy shows promise, but has not competed in either meet because of an illness. The fifth possibility is a boy whose tests show real ability but whose future achievements will be governed by his willingness to work. He is a sophomore who has already scored in a dual meet after missing a previous meet.

It is my hope to follow up this article with another which will show the development of these boys and others as well as the training programs used. In the meantime, you might check your own results after using the tests suggested. There can be no doubt that this screening process will eliminate misdirected efforts and wasted time.

Safe Construction

By DON CASH SEATON

IN PLANNING athletic facilities, it is important first to make a survey of the community life, including a study of population and housing trends, existing school and community recreational facilities, and possible sites.

Wise planning calls for the selection of school sites many years before construction, followed by a complete analysis of the present school enrollment and student needs. Only through such means can present and future requirements be intelligently determined.

SELECTING THE ARCHITECT

Many factors enter into the selection of the proper architect. One admonition, however, should be stressed. Select an architect who has had considerable experience in building athletic facilities and who has designed buildings that reflect vision in meeting physical education needs.

Informing the Architect. The director of physical education or athletics should be cognizant of the hazards of athletic plants and able to inform the architect of the safety implications of the program.

Although a competent architect is expected to know and observe the building codes governing the proposed structure, as well as to possess other technical knowledge with regard to safety, all architects cannot be expected to be familiar with the varied program to be accommodated and its multiplicity of hazards.

Early gymnasiums, built during the horse-and-buggy days of physical education, were expected to accommodate a formal program of calisthenics and apparatus, and it has been difficult for the architect and builder to keep pace with the changes in the program so that he could design buildings suitable for its safe accommodation.

Therefore, the prospective builder (the school administrator) should furnish the architect with an outline of the complete physical education program and its hazards, as it exists and as he expects it to be in the future. From this knowledge the architect should be able to fashion a structure of sufficient size, utility, and flexibility to insure a minimum number of injuries resulting from structural mistakes.

Many architects, however, must be carefully supervised or they will sacrifice utility for appearance.

GENERAL PRINCIPLES

Several general principles of construction for safety should be observed. Each of the following suggestions has a definite bearing on the other, so that each should be considered in relation to the other and to the desired objectives.

Facilities must be constructed in accordance with state building codes and local ordinances covering fire, panic, and other hazards. Probably the first step the physical education or athletic director should take in planning the construction of a new

Needed Space For Safe Play *(measurements in feet, bleacher space not included)*

Sports	*Dimensions of Playing Area*	*Sq. Feet Playing Area*	*Outside Safety Zone END (Minimum)*		*Outside Safety Zone SIDES (Minimum)*		*Total Area Needed (Minimum)*	
			To Wall or Fence	*Between Courts or Bleachers*	*To Wall or Fence*	*Between Courts or Bleachers*	*Dimensions Plus Safety Zones*	*Square Feet*
Archery (outdoor)	500 to 300 x 450	22,500	10	150	10	50	50 x 450	22,500
Badminton (double)	20 x 44	880	8	6	8	5	32 x 56	1,792
Basketball	42 x 72 (minimum)	3,024	8	6	6	6	54 x 84	4,536
Baseball (hard)	90 x 90 (diamond)	8,100	60*	550**	30	30	300 x 300	90,000
Baseball (soft)	60 x 60 (diamond)	3,600	30*	350**	30	30	250 x 250	62,500
Boxing (ring)	20 x 20	400	8	4	8	4	28 x 28	784
Fencing (strip)	5′ 10″ to 6′ 6″ x 40	233	4	6	6	8	18 x 48	874
Field Hockey	150 to 180 x 270 to 300	40,500	20	10	10	10	160 x 280	44,800
Football and Touchball	160 x 360	57,600	20	10	15	10	180 x 380	68,400
Golf Driving Net	9 x 18 x 9 high	162	8	4	4	4	17 x 30	510
Handball (one wall)	20 to 30 x 34 to 45	680	8	6	8	6	32 x 46	1,472
Handball (four wall)	22 x 46 x 22 high	1,012					22 x 46	1,012
Ice Hockey	60 to 110 x 165 to 250	9,900					60 x 165	9,900
Lacrosse	210 to 260 x 450 to 500	94,500	15	10	15	10	230 x 470	108,100
Soccer (men)	150 to 300 x 300 to 390	45,000	15	10	15	10	170 x 320	54,400
Soccer (women)	120 to 180 x 240 to 300	28,800	10	6	10	6	132 x 252	33,264
Speedball (men)	160 x 240 to 360	38,400	15	10	15	10	180 x 260	46,800
Speedball (women)	180 to 200 x 300 to 340	54,000	10	6	10	6	192 x 312	59,904
Swimming Pool	40 x 75	3,000	15		8		56 x 105	5,880
Tennis (double)	36 x 78	2,808	21		16		60 x 120	7,200
Track (outdoor)	24′ x 440 yds.	31,680	10	6	10	6	260 x 610	158,600
Volleyball	30 x 60	1,800	8	6	12	8	46 x 72	3,312
Wrestling (ring)	18 x 18	324	10	10	10	10	28 x 28	784

*To backstop. **Between home plates of facing diamonds.

facility is to consult the architect on the safety restrictions and recommendations of governmental agencies. This step is required for intelligent planning, since certain adjustments are necessitated by these codes.

The architect should consult the safety codes of such national organizations as the National Safety Council, the National Conservation Bureau, and the National Fire Protection Association.

Facilities must be safely and conveniently located. It is desirable that the athletic plant, especially the gymnasium, be separate from the remainder of the building because of the fire danger to large crowds. Special care must be taken to see that it is not located over or near an explosion hazard or near any structure that might be considered a fire hazard, nor should the power plant of the school be located in or near athletic buildings.

It is not desirable to have gymnasiums, playgrounds, or athletic fields divided by, or adjacent to, railroads, heavily traveled streets, or bodies of water. If the location of playing fields makes it necessary for students to encounter traffic hazards, underpasses or overpasses should be constructed. Otherwise, it will be necessary to install signals or assign traffic officers or safety patrols.

Facilities should be large enough to allow for their safe use by peak loads. It is generally recognized, and studies have proven, that overcrowding is responsible for a high accident incidence. With this in mind, new constructions should be planned to insure sufficient space to care for the largest number of participants at any given time.

The determination of the proper size and number of facilities is a very difficult problem because of the rapid expansion and changing concepts of the physical education program. The accompanying table specifies the space needed for safe play in the various sports.

Administrators are warned that the tendency is to build units that are too small and inflexible. Provision must be made for future expansion if population trends seem to warrant it. Fifteen acres should be considered the minimum area necessary for the high school athletic, physical education, and recreation plant; 10 acres the minimum for the junior high school; and seven acres for the elementary school program. College plants require at least 25 acres.

It must be remembered, however, that a facility used eight times a

day by eight groups of 60 students is equal to the same area used only four times a day by groups of 120, or six times a day by groups of 80. In other words, safer and more efficient use is made of facilities when the load is spread out.

It must also be kept in mind that only 20 players can be accommodated on a softball diamond, and only four on a tennis court, regardless of the size of a class or the school enrollment.

Facilities should be *constructed so that it will be possible to segregate* the various activities, age levels, and sexes. Above the third grade it is usually considered desirable to segregate the sexes, but further segregation by age groups is considered necessary from the safety standpoint. Segregation may require the provision of more than one gymnasium, movable partitions, or separate dressing facilities, and will also require separate areas on the playfields.

Facilities should be constructed so that the *activities may be easily supervised.* This provision applies to both indoor and outdoor play areas. Such items as the proper location of the instructor's office and the location of the small children's playground near the school building are representative of provisions to meet this principle.

CONSTRUCTION FOR SAFETY

Consideration must be given to the safe construction of facilities for *adults* when the athletic plant is used for community recreation. More and more the school is returning to one of its earliest uses—as a community center—and the athletic facilities often form the nucleus for such activities.

It is therefore particularly desirable to plan the athletic plant with the safety of adults in mind. This would include such major items as direct accessibility to the department, an accessible first-aid room, elimination of steps, and such minor items as the installation of handrails in showers and swimming pool.

The buildings must be constructed in accordance with state and local building codes. The vast majority of these rules and regulations are directed toward the prevention of fire and panic and means of escape in case of fire. Some of these provisions should be mentioned because of their importance.

All buildings should comprise as few stories as possible, preferably one. The gymnasium should be placed slightly above ground level and spectators should never be

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Reported by H. V. PORTER

National Federation Annual Meeting

REPRESENTATIVES from 43 states plus delegates from Ontario, Canada, and Washington, D. C., attended the annual meeting of the National Federation on December 28-30.

North Carolina became the 46th state to join the Federation, while Texas reported that its executive committee has recommended application for membership and that the Texas high schools will soon vote on the proposal.

Equipment problems. Nearly everyone participated in the informal discussion on equipment problems. The manufacturers' representatives reported on surveys and experimental work, and all groups gave evidence of being "safety conscious" and desirous of further promoting safety.

It was pointed out that there are certain limitations in the manufacture of equipment such as helmets and shoulders pads, and that it is necessary to weigh the protection of the wearer against the protection for the player who comes into contact with the helmet or pad.

In general, studies indicate that the greatest concern, as far as these items are concerned, must be for the wearer. While it has not been possible to reach definite decisions as to what constitutes essential protection and what constitutes dangerous equipment, the manufacturers believe that the hard shell fiber or plastic which must be used to guarantee protection for the wearer, must be in the neighborhood of 95-gauge material. Anything heavier probably represents unnecessary armor.

Surveys seem to indicate that while the helmet-encased head is sometimes deliberately used as a weapon, this is not usually the case and the head is purposely slid past the body of the opponent in an effective block. A smooth surface has some advantage over cross-straps or ridges in this respect.

There seemed to be general agreement that a certain amount of rigidity for helmets is necessary and that this rigidity diffuses the force of a hard blow. Unless there is a degree of rigidity, a blow is localized and tends to cause concussion.

If helmets and shoulder pads must be rigid, there is no great difference between the hardness of fiber, plastic, hard rubber, or of the skull itself. All of them are hard. The webbing or sponge rubber inside the shell is designed to provide a degree of resilience and, to this extent, both wearer and opponent receive some protection.

An outline was given of experimental work being done on shells which are hard enough to spread the effect of the blow but which are slightly resilient. Mention was also made of continued attempts to provide a soft outer covering for all pads and helmets.

It was pointed out that the most effective safety measure appears to be on the inside of the helmet rather than on the outside, since the inside webbing provides the "give" which protects both wearer and opponent. Figures indicate that the greater number of injuries from actual blows appear to come from the knees, elbows, and feet.

Football rules changes. The Football Committee expressed unanimous approval of the work of their representatives during the past year in connection with the efforts to produce a commonly worded code for all amateur groups.

That policy includes the decision to use the 1948 code for high school play in 1949, with the essential modifications determined by the Football Committee. (The major rules changes for 1949 were itemized briefly in last month's *Scholastic Coach*, page 47. A full report on the changes will be carried in *Scholastic Coach* next September.)

Injury study. A study covering 46,824 athletes in four selected states was expounded by Robert Warren of the Security Life and Accident Co. of Denver, Colo. The following injury statistics pertain to football:

BY SQUAD SIZE

15.1%—15 members and under	17.4%—31 to 40 members
14.1%—16 to 20 members and under	17.6%—41 to 50 members
15.2%—21 to 30 members	20.6%—over 50 members

Note the steady increase in injuries that accompanies the increase in squad size. An athlete of a school that fields a squad of 50 or more boys is almost 50% more prone to be injured than if his squad were composed of 16 to 20 members. This is good proof of the value of league competition among schools of comparable size.

BY AGE OF PLAYER

25.5%—under 16	5.3%—18 years
28.7%—16 years	1.5%—19 years
38.5%—17 years	0.5%—20 years

The younger the athlete, the more likely he is to be injured. While the table indicates a high percentage for 17-year-old athletes, this is due to the fact that the large majority of high school players are of that age. A fair comparison is between the 16-year and the 18-year groups, which tends to prove that the 16-year old is five times more likely to be injured.

BY EXPERIENCE

37.0%—first year	22.3%—third year
32.5%—second year	8.2%—fourth year

Because age and experience usually parallel each other, this table closely follows the results shown in the age table. The "greener" the athlete, the more chance he has of being injured.

BY DATE

13.2%—Sept. 1-15	12.2%—Nov. 1-15
17.8%—Sept. 16-30	9.0%—Nov. 16-30
19.8%—Oct. 1-15	4.8%—Dec. 1-15
22.2%—Oct. 16-31	1.0%—Dec. 16-31

The only logical reason, so far advanced, for the injury peak occurring in the last half of October is that teams have completed the easy "warm-up" games and, although not yet in top physical condition, are starting down the hard stretch for a championship. The thought behind the drop in injuries in November is, by that time, squads are usually in the very best of physical condition and a well-conditioned athlete is the best insurance against injuries of every description.

BY PERIOD OF CONTEST

16.5%—first quarter	36.8%—third quarter
19.7%—second quarter	27.0%—fourth quarter

As in previous studies the 3rd quarter is still the danger spot. The compulsory warm-up at the start of the second half has helped some, but additional precautions seem to be needed. More than 70% of all 4th quarter injuries occurred in the final five minutes of the game.

BY POSITION

7.5%—center	26.5%—halfback
14.0%—guard	13.2%—fullback
16.0%—tackle	6.0%—quarterback
16.8%—end	

Before football took to the air, fullbacks and guards traditionally bore the brunt of most injuries. This has changed and injuries are very evenly divided, although the quarterback position is still the safest. Injury to an offensive center is very rare. This is a tribute to American sportsmanship as a player in this position has practically no means of defense. In studying this table, it should be remembered that there are two halfbacks, guards, and ends for each fullback, quarterback, and center.

BY PLAYER'S ABILITY

62.75%—first team	37.25%—substitute

The difference is not as wide as indicated when consideration is given to the fact that a member of the first team who plays most of the time has a much higher exposure to injury than the substitute who plays only a small part of the time.

BY TEAM TACTICS

45.75%—offense	54.25%—defense

Evidently a team tries harder to prevent a score than to make a score.

BY COMPETITION

48.0%—contest	52.0%—practice

Considering that much more time is spent in practice than in actual games, the injury ratio is much higher in contests.

Six-man football rules changes. The following actions were taken concerning the six-man code for 1949.

1. The note under Rule 1-6-3 will be revised to state that the cleated football shoe may be worn, and will also mention the special six-man shoe, which is safer.

2. The present limit on number of substitutes who may enter at a given time will be removed. Rule 3-7-2 will make it clear that the entire team may be replaced any time ball is dead, provided the substitution is completed in time.

3. The editorial committee was au-

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Fundamental Badminton

(Continued from page 22)

handle on the backhand grip.

On a full swing on the backhand, *after* contact is made, it will be noticed that the racket has a tendency to turn over (away from the body) on the follow-through. Do not try to stop this natural follow-through movement. Allow the wrist to freely follow the direction of the racket head and a strong, rhythmic stroke will result.

By swinging at an imaginary shuttle, the novice will more quickly mold these wrist actions into a complete, even uninterrupted movement. One way of finding out whether or not you are getting your wrist "into" the stroke is by listening to the sound of the racket going through the air.

Take a full swing with the arm. If you keep your wrist locked, there will not be much sound. But if the wrist is cocked and then released mid-way through the swing there will be a swishing sound as the racket thrashes the air.

The wrist plays the most important physical part in the deception of the game.

As we have seen, the wrist can bend backwards, forwards, and sideways. Control over these wrist movements can reach such a high standard of perfection that they can be made at all speeds—fast to slow.

CHANGE OF PACE

This change of pace is most effective when all the preliminary actions of the stroke look alike. For example, the arm may look as though it is coming through quickly to make a smash and the wrist, cocked back, may add its additional pace to the arm or it may come through slowly—with a slow-motion action—and the shuttle, instead of flashing over the net as a smash, may float gently down near the net as a drop-shot. Or, an "obvious" looking soft shot may instantly become a fast one by a sudden quickening of the wrist.

Not only can the wrist change the pace of a shot at the last moment, but it can also alter the direction of the return. By turning the wrist slightly one way or the other as the forearm moves into stroking position, the shuttle can be directed to one side of the court or the other.

No individual can become a great player until the flawless blending of these two wrist movements are perfected to keep the racket head under complete control.

The quickness with which the wrist can be brought into action so late in the production of a stroke, without giving any indication of the return's speed or direction, makes badminton the most deceptive of all sports.

Remember, the wrist movement is a complete movement of its own but it is not the only movement in the production of a stroke—footwork, body positioning, and arm action must be correct for the wrist to be utilized to the best advantage.

An amazing number of good athletes continue to let the incorrect holding of the racket handicap them in making the most of their natural ability.

All champions in every sport regularly check the fundamentals of their particular activity to see that they have not carelessly strayed away from the solid foundations on which they have built their success.

Even though you may not have the desire or time to become a champion, much more enjoyment and satisfaction may be gleaned by playing every stroke correctly rather than idling purposelessly around on the court.

Free Throwing: *Which Style?*

By G. LAURENCE RARICK and WESLEY M. STATON

HUNDREDS, maybe thousands, of basketball games every year are won or lost at the free-throw line. Wander into any practice session from Alameda to Zanesville and you will find foul shooting an integral part of the daily routine.

Some coaches insist on one particular style of shooting, while others permit their boys to develop a style of their own. The three most common methods include the two-hand underhand, the two-hand overhand, and the one-hand overhand.

In the past, most coaches favored the two-hand underhand style. More recently, however, the one-hand shot has come into favor. The feeling is that a player who employs this shot proficiently in set shooting should not be asked to learn a different shot at the free-throw line.

Another, though smaller, group of coaches contend that the two-hand overhand shot is the most effective, particularly for players who take their sets that way.

The literature is practically devoid of studies pertaining to the relative effectiveness of these three forms of free throwing. C. W. Millet,[1] in a study of some 154 junior high school boys in four physical education classes, utilized the rotation procedure in studying the relative efficiency of these three styles.

The groups were rotated so that while one group was being taught the two-hand underhand method, a second group was being taught the two-hand overhand shot, and the third was learning the one-hand overhand style. The groups were rotated three times so that each group had a chance to learn each of the three forms.

An analysis of the results indicate that no one method excelled the other two to a degree great enough to recommend its use to the exclusion of the other two. However, the results did show a slight superiority for the two-hand underhand shot and that the one-hand style yielded the poorest returns.

The validity of the results might be questioned on two counts: (1) The shooting distance was too great for some of the boys, probably giving an inordinately high weighting to the underhand method; and (2) the number of shots allowed and the duration of the experiment were probably not sufficient.

Though recognizing the limitations of a mass study, the authors felt that a survey of the free-throwing styles used by star college players under game conditions might prove of value.

Therefore, data were collected on 26 college games played in the Boston Garden and Boston Arena during the 1946-47 season. Twenty-five nationally representative teams participated in these games. Eighteen were from the East Coast, four from the Middle West, two from the South, and one from the Far West.

A record was kept of every free throw taken, the name of the shooter, the style of shot used, and the success or failure of the attempt. Observations were thus made upon 146 players taking a total of 671 free throws.

The data were handled in two ways: first, the percentage of shots made with each method was computed; and, second, the individual raw score (percentage) was determined for each player.

The first table shows the total of shots attempted and the shots made. As indicated, more shots were taken with the two-hand underhand method than with either of the other two—with the two-hand overhand style producing the lowest over-all percentage of success.

The raw scores of the 146 players were then grouped according to shooting style; and the mean score, standard deviation, and the standard error were computed for each of the three methods.

Critical ratios were calculated for the three methods to determine whether or not a significant difference existed among the groups. The calculations, based upon individual performance as represented by raw scores, permitted a more extensive statistical treatment of the data than would be possible if only group percentages were considered. This data is shown in the second table.

On the basis of Sorensen's table,[2] which indicates the chances in 1000 in which a true difference would be expected to occur, the following values were assigned to the respective differences in the means:

1.52	935 chances in 1000
.89	813 chances in 1000
.34	634 chances in 1000

Due to the preciseness of the measure (that is, the ease with which one could decide on the type of shot being used at the time), a 2.6% level of significance might logically have been selected.

However, since the groups employing the three methods were not equated, a lower level of 1.0% was chosen as indicating statistical significance.

Since none of the critical ratios achieved this level of significance, the highest level being that between the two-hand underhand and the two-hand overhand, there appears to be no statistical significance among the three methods for the players observed.

In short, no one method seems to be significantly superior to the other

(Continued on page 62)

PERCENT SHOTS MADE

Method	Tries	Made	%
Two-hand overhand	245	127	51.8
Underhand	282	158	56.0
One-hand overhand	144	82	56.9

MEAN, STANDARD DEVIATION, and STANDARD ERROR

Method	Players using	Mean score	Stand. dev.	Stand. error
Two-hand overhand	53	44.4	32.5	4.5
Underhand	73	53.4	33.6	4.0
One-hand overhand	20	51.0	26.8	6.0

[1]Millet, C. W., "An Experimental Evaluation of Three Styles of Basketball Free Throwing." Unpublished Master's Thesis, U. of Southern California, 1946.

[2]Sorenson, Herbert, *Statistics for Students of Psychology and Education*, New York, McGraw-Hill Book Co., Inc., 1936, p. 367.

Safety in New Construction

(Continued from page 43)

housed higher than the second story. The reasons for this are obvious, the most important being that, in the event of fire, large numbers of spectators might be trapped in the higher stories, with resultant loss of life. The National Fire Protection Association recommends that no balcony exit be higher than 20 feet above the finished grade.

Sufficient safe interior stair exits should be provided for the handling of peak loads. It is generally recognized that outside fire escapes are not desirable and that smokeproof tower stairways should be installed. Exits should be adequate to empty the peak load of the building in a minute and a half. The building code will specify the number and size of exits required to handle the largest expected crowd.

Adequate fire-fighting equipment must be included and housed in such a way that it will not be hazardous to passers-by. Local ordinances will specify these requirements. Storage space and servicerooms that may be fire hazards should be furnished with automatic sprinkler systems.

The Heating and Ventilating System. It is strongly recommended that radiant floor heating be used in dressing rooms, showers, toilets, and special exercise rooms where cold floors are a source of discomfort and a possible health hazard. It may also be desirable in the gymnasium proper.

THE RADIATORS

When steam or hot-water heating is used, radiators should be of the overhead type or else recessed, with screen protection if it is necessary to intall them lower than eight feet.

A mechanical system of ventilation should be installed in the gymnasium, but whether it is or not, windows must be provided that will operate mechanically and be safe when opened.

Lighting for Safety. Natural and artificial lighting should be sufficient to insure safety in dressing and showering and in passing to and from the athletic facilities. For natural illumination, bilateral lighting is desirable.

Windows should be placed as high as possible (at least 10 feet above the floor), and should not be located at the ends of the gym unless glass that diffuses the light sufficiently to prevent glare is used. The windows should cover a wall area equal to one fourth or one fifth of the floor space. *Glass brick* gives promise of being the ideal type of natural illumination for gyms, field houses, and swimming pools. Prospective builders are encouraged to investigate its use for windows and walls.

Fluorescent lighting may prove the most satisfactory artificial illumination for indoor recreation areas. Two basic minimum requirements are:

1. There must be sufficient quantity of light (foot-candles). Since players are often required to look directly toward the source of light it is difficult to furnish sufficient brightness yet not "blind" the players.

2. The light must be so applied that the distribution of brightness (foot-lamberts) in the visual field does not cause unnecessary annoyance or discomfort. Recreation areas present a problem in this respect too, because the eye must follow moving objects and an excessive variation in the intensity of illumination is annoying.

It is recommended that *germicidal irradiation* to kill airborne germs and bacteria be installed in certain areas of the plant. It is particularly valuable for use in the first-aid or training rooms, locker and dressing rooms, toilets, and in special exercise rooms where large numbers of persons congregate in small spaces for strenuous exercise.

Such ultra-violet irradiation is desirable in the gym or field house where large crowds gather, but it is probably impractical. All light fixtures should have screen protection.

(The author's recommendations for gymnasiums and field houses will appear in a subsequent issue of Scholastic Coach.)

FORMERLY Illinois State Director of Physical Education and varsity track coach at the U. of Illinois, Don Cash Seaton is now head of the department of physical education and track coach at the U. of Kentucky. This article is reprinted from Chapter VIII of his excellent new text, "Safety in Sports" (Prentice-Hall, Inc.), a review of which appeared on page 66 of last month's Scholastic Coach.

Indoor Drills for the Baseball Coach

(Continued from page 7)

on the other half. The outfielders should also participate in these drills, since most of the fundamentals are of value to both.

Two-Man Fielding Drill: Two players, designated as "A" and "B", face each other six feet apart. "A", who uses a glove and will do the fielding, lobs a ball about shoulder high to "B". "B" then pats or hits the ball with the palm of his hand so that it bounces towards "A", who fields the ball and then lobs it up again to "B". The action is repeated with "B" varying the bounce and direction of the ball, patting it so that "A" will have to scoop the ball to his left and right.

If executed properly, this drill will furnish all the elements of fielding a ground ball, with the exception of the throw. It also helps improve hand-eye coordination. After one player has fielded for a time, he should switch assignments with his partner. Since little space is required for this drill it is possible to have at least ten pairs of players working in an area 30′ by 15′.

Trap Drill: Chalk in two bases at either end of the infielders area, parallel to a wall. If space permits, make the distance between bases 90′. If not, measure as close to this as possible. Use three infielders and a base runner.

Start by calling out a situation such as, "A runner is trapped off first." Immediately the three infielders take assigned positions, and the first baseman starts the runner toward second. The second baseman protects first, while the shortstop covers second.

Soon as the first baseman has started the runner sufficiently toward second, he throws the ball to the shortstop covering the bag. The latter then starts the runner back to first where the put-out should be made. The first baseman passes both the runner and the shortstop on the side opposite his throwing arm, and takes the protecting position at second.

The out, insofar as is possible, should always be made at the base from which the play started. Two throws are all that should normally be required.

The coach may vary the drill by calling out other situations such as: "Runner is trapped off second"; "Runner caught off third base" (use a catcher in this situation); or "Runner undecided." In the latter situation, where the runner stops between bases, the infielder having the ball should rush directly at him and force him to commit himself.

The coach should divide his infielders into units of four (one being a runner) so that one unit is resting and observing while another is actively participating.

Ground Ball Drill: Use the entire indoor area for this drill. It consists of fielding a simulated batted ground ball, followed by a throw to a baseman. With the exception of a baseman to take the throws, all players participate in the drill. Line up the candidates at one end of the gym, and station the baseman who will take the throws at the other end with his back to the wall.

Now throw a ground ball to the far side of the first fielder on line. The latter breaks for the ball, fields it, straightens up, throws to the baseman, then takes his place on the opposite side to start a new line.

ROBERT TIERNEY, baseball coach and physical education instructor at Queens College (N. Y.), started his coaching career in 1935 at Columbia Grammar and Prep School, New York City. After two years, he moved on to the Radburn (N. J.) School, where he remained until accepting his present post at Queens College, in 1940. During the war, Coach Tierney served overseas as a captain in the 63rd Infantry Division and received the Bronze Star and the Purple Heart for wounds received in combat.

After all the fielders have completed a play, the process is repeated from the other side of the floor. In throwing the ground balls, vary the speed and direction to simulate actual infield chances.

Baseman's Put-Out Drill: This drill is designed primarily for shortstops and second and third basemen. Use a baseman, a base runner, and a "thrower." First, tie two mats together (covers of mats should be shellacked) and place a base in the center. Next line up the baseman at the side of the base about six feet away, and put the base runner along a simulated base-line about 15 feet back. At a signal from the "thrower," the runner breaks and slides into the base as the baseman covers the bag. The ball is thrown or lobbed underhand to the baseman, who tags the runner.

Points to be stressed include: (1) Straddle the base so that the side of the bag into which the runner is sliding is not blocked by the feet. (2) Place the glove with the ball held firmly in it on the side of the bag. (3) Let the runner slide into the glove. (4) In putting the ball on a runner who is not sliding, tag him with the gloved hand which is firmly holding the ball.

Pepper Drill: The drill consists of a batter and five fielders on a line side by side about 12′ to 15′ from the batsman. A fielder throws the ball to the batter who bunts or, with a choked easy swing, hits ground balls to the fielders. One half of the gym should be used for the "pepper drill." If space permits, more than one unit may be used at the same time.

Place the batter so that his back is to a wall, but the direction of the hitting should be parallel with and not toward the area being used by the battery. This will eliminate any possible confusion between the areas.

COMBINATION DRILLS

Pitcher-First Baseman Drill: The drill is set up with a pitcher, a first baseman, and a catcher. The pitcher toes the rubber and without a wind up, throws to the catcher. The latter then throws a ground ball to the right of the first baseman. After the ball touches the ground, the pitcher starts toward first base and takes an underhand throw from the first baseman for the put out.

The following points should be stressed: (1) As the ball is thrown, the pitcher moves directly toward the first-base line, then veers to his left so that he comes up to the base parallel to the foul line. (2) The pitcher should receive the ball a stride from the base, then touch the inside edge of the base with his right foot. He should not cross the bag, to avoid a collision with the runner. (3) The first baseman should use an underhand lob or throw, the speed of which depends on his distance from the bag. The ball should reach the pitcher one stride before he reaches the base. (4) If the first baseman can make the put out himself, he should wave the pitcher out of the play.

The drill may be varied by using a runner who breaks for the base after the catcher throws the ball. The drill should take up half of the floor space. Set it up in a corner of the gym with the first-base line running parallel to a long wall.

Bunt Defense Drill: The entire gym is used for this drill. Place home

plate in a corner and set the bases as near 90′ apart as space permits. Set up a regular infield of catcher, pitcher, shortstop, first, second and third baseman.

Call out a situation such as: "Runner on first, no outs." The pitcher then throws easily to the plate, and the batter bunts to either side of the diamond and becomes a base runner. As the ball is pitched, the pitcher, first, and third basemen move toward the plate. The second baseman covers first and the shortstop covers second.

The catcher calls the play by designating the player to field the ball. If the third baseman fields the bunt, the catcher moves down to cover third. If another player fields the ball, the third baseman covers his own bag. Other situations are then called out, such as: "Runners on first and second, no outs"; "Bases filled, one out"; etc. After the runners are placed on bases and the ball is pitched, the defensive players move into the correct defensive pattern and complete the play.

OFFENSIVE DRILLS

Sliding Drill: Tie together two mats which have shellac coverings. Place a base in the center and secure it to the mat with two cross-pieces of two-inch wide tape. Have the players remove their rubber-soled shoes and line them up evenly 25′ from the base.

Now have each player run up and use a hook or fade-away slide to either side of the bag. The player should then walk back and rejoin the line. This drill may be combined with the previously described "Baseman's Put-Out Drill."

Several factors should be stressed: (1) Take off from 10 to 15′ away so that the slide is actually into the bag. Do not wait until almost on top of the bag and then jump at it. (2) Never change the mind once the slide is started. This is one of the main causes of leg and ankle injuries.

Base-Running Drill: Measure off a distance as close to 90′ as safety will permit, from a corner of the gym running parallel to a long wall. Put down a bag for first base and secure it to the floor with cross-pieces of adhesive.

Line the boys up behind home plate. First have them leave the box as if beating out an infield roller. The player should not jump at the bag but should learn to alight squarely on top with either foot to avoid ankle injury.

Next, have them run as if on a hit to the outfield. The practice here is on making the turn. The player should veer to the outside of the base-line when about 20′ from first, then turn sharply toward second by pivoting, preferably with the left foot, on the inside of the bag.

In conducting baseball drills indoors, the coach must enforce a set of well thought-out safety rules.

1. Make out a floor plan indicating the areas assigned to the various drills.
2. Bisect the floor area with a chalk line, setting aside one half for the battery and the other half for the infield drills. Do not allow any man to go over this line while a pitching drill is going on.
3. Use only the minimum number of baseballs necessary. A stray ball carelessly thrown constitutes a serious hazard.
4. Insist that players entering the area while drills are in progress, walk around the outside of the gym.
5. Limit the indoor area to members of the squad only.
6. Insist that rubber-soled shoes be used by all candidates.
7. Caution players to remove shoes when taking part in sliding.
8. Check the lighting for blind spots before using the gym.
9. Inspect the area to see that sharp objects or apparatus are not protruding from the wall.

Coaches' Corner

Please send all contributions to this column to Scholastic Coach, Coaches' Corner Dept., 7 East 12th St., New York 3, N. Y.

ALTHOUGH fullback Jackie Jensen made most of the headlines for the California football team, it was rugged line play that kept the Golden Bears among the undefeated.

John Cunningham, the big end, was a terror on defense. After watching John smash a dozen Wisconsin end runs, Coach Lynn Waldorf asked him to describe his technique.

"Well," John said, "the second the ball is snapped, I charge into their backfield."

"Yes?"

"I grab a handful of backfield men."

"Yes?"

"I toss 'em off one by one till I come to the one with the ball."

"Then?"

Cunningham grinned. "I keep him."

Herman Hickman, the Yale grid coach, can spin a tale with the best of them. His favorite story goes back to the time he was coaching at West Point. It seems a Mississippi boy received an appointment to the Academy, much to the dismay of his grandfather, an unreconstructed Rebel.

"Go on up there if you have to," advised grandfather. "Learn all you can. Learn about war and tactics, son. Learn about transportation. Find out everything you can. *This thing ain't over with yet!*"

Our chapeau is off to Bruce Drake, Oklahoma hoop brain. Some weeks back we saw him pull as smart a play as we've ever seen on the hardwood. City College of New York was beating his team by two points with but three seconds to go. Oklahoma had the ball out of bounds along the defensive end line. The Sooners called time and the captain went into a huddle with the officials. That was the tip-off that something unusual was going to be sprung.

Now, remember, in visualizing this play, that the clock does not start to move on a pass-in from out of bounds until the ball strikes the court or is touched by a man in bounds.

The referee handed the ball to Ken Pryor, who stood out of bounds on the right side of the basket. Instead of flipping the ball in. Pryor pitched it to Walter Morris, stationed out of bounds on the other side of the basket. Pryor then blazed diagonally down court past a triple screen set up by his three teammates. Morris heaved a long lead pass, which Pryor gathered in two-thirds of the way down court.

Only then, when Pryor took the ball, did the clock start to tick away the final three seconds. Pryor took two fast dribbles and let fly with a frantic hook—which hit the rim and slithered away.

"It's a play we've rehearsed," Drake explained. "Had the screens worked perfectly, Pryor would have been in the clear for a close-in shot. It's legal, too. After a goal, you can pass out of bounds to as many men as you like as long as you put the ball into play within five seconds."

Who says Michigan turns out great football teams? They have played in the Rose Bowl twice—in 1902 and 1948. Both times they won by 49-0. In short, they haven't improved a lick in 46 years!

Did you note the unusual fact that three members of the U.S.C. backfield last season were named Dean Dill, Don Doll, and Dan Dall? Sounds like a lot of pickles to us.

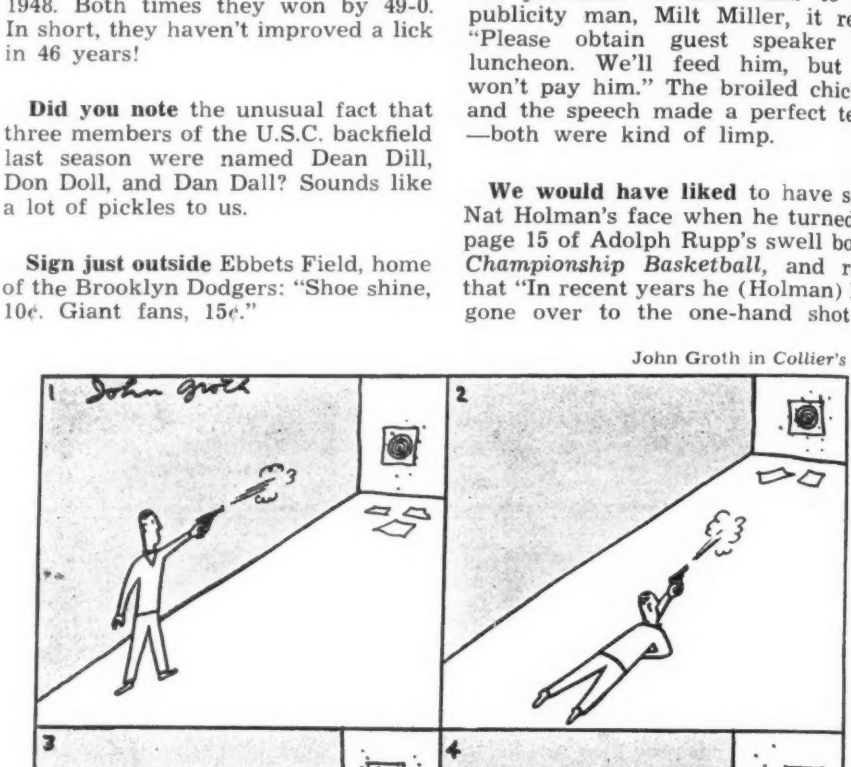
Sign just outside Ebbets Field, home of the Brooklyn Dodgers: "Shoe shine, 10¢. Giant fans, 15¢."

Dick Schmelzer, the soccer coach at R.P.I., has a happy gleam in his eyes these days. It was put there by four defeats of his unbeaten soccer team. No, this isn't double talk. It seems that nobody could beat his club last season—but the freshmen! In seven informal games, the frosh knocked off the varsity four times and tied them three other times. Dick is now contemplating the next three years through rose-tinted glasses.

We met Dick, a real sweet guy, at the annual meeting of the National Soccer Coaches Assn. We were there as guest speaker, but we had no illusions about why we had been selected. Before ascending the rostrum we happened to get a look at the telegram that evoked the invite. Sent by the president of the Assn. to the publicity man, Milt Miller, it read: "Please obtain guest speaker for luncheon. We'll feed him, but we won't pay him." The broiled chicken and the speech made a perfect team —both were kind of limp.

We would have liked to have seen Nat Holman's face when he turned to page 15 of Adolph Rupp's swell book, *Championship Basketball,* and read that "In recent years he (Holman) has gone over to the one-hand shot to

John Groth in *Collier's*



such a degree that one rarely sees City College players shooting with two hands from near the middle of the court."

No, no, that's a foul, Mr. Rupp. The surest way of getting a quick shower at City College is to heave a one-hander from mid-court. It's true that Holman allows his boys a lot more freedom with one handers than he used to, but the shots have to be taken from close-in shooting range. From far out, the two-handed set is still City's stock shooting weapon.

That peerless purveyor of fairy tales, Bill Stern, is in nice voice these days and doing his usual sterling job of pumping hot air into little molecules of truth. "Did you know," Stern will ask dramatically, his great, resonant voice throbbing huskily, "that George Poschner lay in no-man's land, a bullet in his brain, with no legs? Did you?" (No, old man, we didn't.) And before you can snap out of your trance, Stern switches the program to a hospital and Poschner—ALIVE—talks to you.

You didn't know about the team killed in action? Stern will gladly tell you all the gory details as he whips himself into a frenzy. "Ah, yes," he will say, broodingly, "there are many strange stories about the lives of fighters—strange and incredible tales." Then he will spin some fantastic story, building up to that breathless pause, when his voice will quaver and he will announce triumphantly, ". . . and that fighter's name was JACK DEMPSEY!"

We understand those fun-loving kids in Hollywood are now making a movie of Stern's life. Our local movie emporium will have to give away a set of matching Rolls Royces to get us into the joint that night.

In our December *Here Below*, we patted ourself on the back for having introduced the Double Quarterback T in our columns as far back as April 1946. Then came this note from Harry O'Mealy, coach and athletic director at Nogales (Ariz.) High School.

"I make no claims for inventing the double quarterback T. Someone, somewhere, probably used it long ago. BUT . . . while coaching at Two Rivers (Wis.) High in the fall of 1943, I used a double quarterback T and won all our games with it. (We went on to complete the 1946 season with a string of 29 unbeaten games.)

It always makes a high school coach sore to see the newspaper and magazine glamor boys reap all the credit for things which have been used for years in the high schools."

That big Sugar Bowl basketball tournament featuring St. Louis U., Kentucky, Holy Cross, and Tulane, produced a nice quota of oddities. St. Louis scored the fewest number of points, 103, in the two-night stand, yet won the tourney. Kentucky scored the next lowest total, 118, and finished second. Tulane scored 128 points and

(Concluded on page 60)

High Hurdling

(Continued from page 11)

air. Here for the FIRST time we have some objective data.

Even good hurdlers are slower clearing the hurdle than is generally believed. Here we find a range of clearance times of from *.491 sec.* to *.351 sec.* for the first hurdle.

We would naturally expect these men to improve their time as the race progresses. (Dillard claims he reaches peak speed at the 6th hurdle, although the writer guesses sooner.)

Even if Dillard achieves a maximum running speed of 33 ft. per second, near the ultimate in human effort, he cannot still hope to get back to earth in less than *.363 sec.* if he maintains his average clearance distance of *13 ft.*

It is the writer's sincerest belief that it is improbable for a high hurdler to maintain a clearance velocity of this magnitude, despite the high take-off velocity he may develop in his spring stride into the air.

It was quite apparent here that these men did not simply step into the air over the hurdle, but *drove forward and upward at a minimum angle consistent with their running velocity just sufficiently high to clear the hurdle.*

This is also one of the more apparent differences between good and poor hurdlers. The latter become so *step conscious*—that is, they do not drive off the ground and maintain a high average velocity of clearance — that they invariably slow down to step over the hurdle. This timing concept appears very essential here.

Duff and Finley take off at very low angles, driving forward with the arms and leading with the head while breaking terrifically at the waist; whereas Dillard broad jumps the hurdle, leaving the ground in a fairly erect position and not making his forward plunge as early in the clearance.

Dillard's clearance in these tests was not nearly as close as was Duff's. Finley merely steps forward at a very low driving angle, throwing his whole upper body forward and raising his overall body weight very little.

Finley lands in a much better position than the other men, with his center of body weight in a good position over the landing leg and his body fairly erect. Thus, he is ready to step forward for the next stride, while Duff and Dillard land

ONE of the greatest pole vaulters of all time, Richard V. Ganslen was undefeated in intercollegiate competition in 1939 and won the NCAA title with a 14-ft. 5-in. vault. He became interested in detailed motion picture studies while doing post-graduate work at Springfield College, and continued his research with noteworthy success at Rutgers University. While at Rutgers, he contributed many valuable articles to Scholastic Coach on the mechanics of the vault. His current contribution was written just before he left Rutgers for his present post in the physical education department of the U. of Illinois.

with their center of body weight nearer the heels and thus are forced to *break at the waist or hold their break until such a time as the body weight rides forward over the take-off foot again for the next step.*

As soon as Finley clears the hurdle, he snaps the lead leg down again with a break at the knee, not being forced to wait for his body weight to drop any appreciable distance, and he is off to the second hurdle.

Hurdlers like Dillard and Duff get into their next stride by making a *conscious rapid drag-through of the trailing leg.* They are thus able to maintain good forward speed throughout.

Dillard brings his knee through in a position against his chest so that in actual practice he is able to bring into play the hamstring muscles of his thigh, thus seemingly getting more speed and power in the drag-through phase.

Most hurdlers bring the trailing leg through without rotating the thigh quite so much. Thus, Dillard comes into his landing with his heel and foreleg more parallel to the direction of travel; unknowingly, he is utilizing *a different muscle group to a greater advantage,* whereas many hurdlers try to pull the leg down with the thigh adductors, *which, though powerful for their length, have a limited range of movement.*

These adductor muscles can apply great force, but only for short distances in dragging the trailing leg forward. This technique employed here by Dillard deserves careful consideration!

The advantage of height is obvious here. With little upward projection velocity of the body, the tall man's body can be lifted a mini-

Memo to

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mum distance and his take-off angle can be much lower; meaning less up and down time and more of the projection velocity in a forward direction.

The shorter man, despite good form, is forced to take-off at a higher angle than the taller man in order to achieve sufficient height to clear the hurdle. Thus he frequently gets excessive clearance height. His energy is wasted more in up-and-down motion than in forward motion.

The landing attitude at the moment the lead foot strikes the ground, is not as sound mechanically in the jump type of hurdle, characteristic of the shorter men, since *they tend to land with the body weight considerably behind the foot and are somewhat handicapped getting into their next stride.*

A hurdler such as Dillard remains in the air between *.450* and *.491 sec.* over each hurdle; or, in a complete flight of hurdles, he spends *4.91 secs.* of his total time flying in the air—*time when he is not applying power.* He thus has only *9.1 sec.* to run the other 198 feet of the hurdle distance, using Dillard's average clearance distance per hurdle.

DILLARD CALCULATIONS

In order for Dillard to run 14 flat in the highs, he must maintain a speed of only *21.75 ft.* per sec. between hurdles. At that rate, a man could run 100 yards in 13.6 secs. These calculations do not take into consideration the time lost in accelerating from the start.

By contrast, Finley, whose average clearance velocity was quite good at *27.6 ft.* per second, spends only *3.86 secs.* in the air during the hurdle race and must run *22.1 ft.* per sec. velocity to hit the 14 flat figure.

Duff will remain in the air at the most *4.56 sec.*, but must average *23.3 ft.* per sec. to complete the race in 14 flat.

At first glance, this data is confusing. But the reader must remember that while Dillard was making *130 ft.* on his hurdles, Finley was only covering *101 ft. 8 in.*

The 1.05 sec. Dillard consumed in flight were used to go an additional *28 ft.* or so. The difference in clearance velocity for these men was only *1.15 ft. per sec.*, using Finley's poorest clearance velocity.

Dillard, clearing his hurdle in *.491 sec.* for the *13 ft. 2 in.* flight, is averaging *26.5 ft. per sec.*, while Finley making *10 ft. 2 in.* in *.386 sec.* is averaging *26.3 ft.* per sec. Thus, at comparable clearance velocities, Dil-

lard gains *3 ft. per hurdle.*

Not once in their hurdle trips did the head of any of these men rise to a point more than 5 ft. 9 in. above the ground. Duff cleared with the top of his head at 5 ft. 6 in., with Dillard's head at 5 ft. 8 in. and Finley's at 5 ft. 9 in.

These men attempt to dive forward over the hurdle with a minimum upward lift and a maximum tuck and leg lay-out.

QUESTION OF STANDARDS

Coaches must examine the question of *whether it is advisable to set up inflexible standards of optimal clearance distance without careful consideration of the hurdler.*

That is, a hurdler who may not drive well on the flat may run good hurdles because he drives well over the barriers and maintains a good average speed. Some men spring more effectively with a barrier or an objective before them.

The coach must concern himself not with how far the hurdler travels but with his speed in covering whatever distance he sails.

The hurdler *must also drive off into and over each hurdle and not slow down and step over them.*

Poor hurdlers are often too step conscious. It is also quite obvious that the more time the hurdler spends in the air, the less time he can apply power. With slow runners who cannot accelerate well after each landing, this is fatal.

A man does not have to be exceptionally fast between the hurdles if his clearance velocity is high. Conversely, if he clears slowly he must obviously run much faster—a deduction so obvious that even hurdlers sometimes miss the point.

The difficulty in maintaining 13-sec.-to-the-100-yd. speed is evident when you remember the time lost in getting started over the first hurdle and the effort of falling into the smooth powerful striding rhythm so essential to stop hurdling efficiency.

To run 13.6 sec. in the high hurdles at the Kansas Relays, Dillard averaged 22.7 ft. per sec. or an average speed between the hurdles including the start of 12.7 sec. per 100 yds.

(Readers interested in Mr. Ganslen's detailed studies on pole vaulting are referred to the following articles, all of which have appeared in *Scholastic Coach.*

"The Pole Makes the Vaulter," March, 1948.

"Vaulting by America's Big Six," April and May, 1948.

"Mechanics of the Pole Vault," March through May, 1947.)

National Federation Annual Meeting

(Continued from page 46)

thorized to modify the rule concerning a kick which touches something on or behind the *kicker's* goal line, provided such change can be made without affecting an excessive number of other sections. This would bring the six-man code into harmony with the eleven-man code, i.e., any kick into the *receiver's* end zone becomes dead as soon as it touches there, but a kick which rebounds into the *kicker's* end zone will remain alive. This will involve slight modifications in the dead ball table (4-2-2), in 6-2-9 and 8-5.

4. Rule 8-5-5 will be slightly revised to make it clear that after a safety, the ball is kicked from the 30-yard line and, after a touchback, the snap is from the 15.

5. The Committee authorized necessary modifications which may be required to keep the six-man code in harmony with the eleven-man code, This includes revision of the penalty enforcement rule as it applies to a foul which occurs during a running play.

In brief, this involves two differences from last year's procedure: (a) A backward pass or fumble which occurs beyond the line will be treated as a part of the run which precedes such backward pass or fumble; and (b) The basic enforcement spot for a foul during a running play (including the backward pass or fumble in (a)) will be the spot where the run ends instead of the spot of dead ball.

Election of officers. R. E. Rawlins, president of the National Federation from 1944-1949, was honored in a series of tributes and presented with an attractive plaque, for his 20 years of service as a member of the Executive Committee.

Three members were elected to the Executive Committee. C. A. Semler (to succeed himself), representing Section 2; C. E. Wetmore, representing Section 4; and E. N. Nordgaard representing Section 6.

The Executive Committee reorganized by electing Mr. Semler, president; and S. F. Burke, vice-president and chairman of the National Federation Football Committee.

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"Coaches' Corner"

(Continued from page 55)

finished third, while Holy Cross racked up the most points, 131, and finished last.

Our friend down in Richmond, Va., Johnny Core, is all hepped up about his Five Star Track Event, and he has a right to be. He has evolved a formula by which the track coach can screen his material and place them in the right events. Does it work? This story will give you an idea.

Back in 1946, Lee Early, of John Marshall High School, Richmond, decided to become a high jumper. By the end of the season, he was doing a rather ordinary 5-2. The school then held a Five Star Post-Season Field Day, and Lee, much to his surprise, turned in a 2:16.6 half mile, which was 16% better than his jump event.

In 1947 he voluntarily switched to the half and wound up a close second to a new state record performance of 1:58.3. The following season, his second as a half miler, he ran five yards behind Jones of George Washington High, Alexandria, in the state meet. Jones then set the 1948 national high school mark of 1:57. But for Five Star, Early would still be struggling with the high jump.

King Kong Klein, the famous ex-NYU basketball and football star, is now a crack high school official out Westchester (N. Y.) way, and it's nice to know he still retains the sense of humor that once made him such good sports copy.

In a recent game between two rivals, Klein thought he detected contact. He tooted his whistle and called "Foul, hipping." The culprit screamed "But I never touched him!" Klein shook his head, "Then you should have, because I called it."

All you men who permanently file our special January Building and Equipment issue, had better dig out your copy and turn to page 12. This page shows the layout of the sensational new gym at Utica, N. Y. You'll notice that the three cross-courts look as though they are placed within the front edges of the opened telescopic gym seats. This is a boner.

The principal reason for using telescopic gym seats (as opposed to the built-in type) is the fact that the telescopic seats fold back toward the walls, leaving nearly the full width of the gym for the cross-courts.

We are beholden to Ray Higgins, of the Fred Medart Products, Inc., for spotting this grotesquerie. Medart, incidentally, is chiefly responsible for that "New Look" Utica gym. They furnished the lockers, telescopic gym seats, basketball backstops, and all the gym apparatus except the folding partitions and mats.

"Last month you carried an item about how Amityville (N. Y.) High snapped Mepham High's string of 10 straight wrestling wins. How I wish it were true! We've been trying since 1939 to pin the Pirates and have yet to succeed. It was Ed Reinisch's Baldwin High team that cracked the Mepham streak." W. H. Ball, Athletic Director, Amityville.

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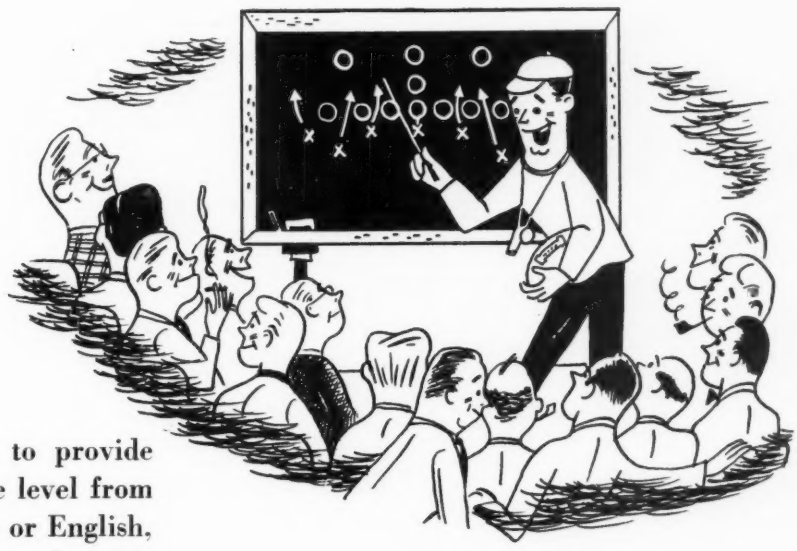

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Double 'em Up!

(Continued from page 10)

late, it is often advisable to be satisfied with just one out. This situation often develops when the batter hits to the wrong side of the infield. This means that the player covering is farther from the bag when the ball is hit. Few double plays can be made in such a situation, and the player covering should consider this fact as he runs to the bag.

The oft-repeated phrase, "Make one sure!", must always be kept in mind by a second base combination. The player originating the action should not foolishly hurry his throw or throw too quickly when there is only the remotest chance for a double play.

The pivoter likewise must consider the situation. The cardinal sin is to try for two when there is no chance of completing the play—even with perfect ball-handling. Over-anxiousness is a very common error of judgment. Although such failures do not appear in the box score, they are errors of omission that may prove far more disastrous and demoralizing than a physical error.

•

Which Style Free Throw?

(Continued from page 48)

two, at least at the level of significance selected here. However, if the players could be considered a truly representative group, it would appear that the underhand and the one-hand overhand styles produce better results in the long run.

It should be kept in mind that massed data of this type make little if any allowance for the differences between individual performers. There is also no assurance that the athletes embraced by this study are utilizing the method best suited to themselves. You have no way of knowing what the individual might have accomplished with another style.

On the other hand, controlled experimental studies are not conducted under game conditions, thereby losing the psychological and emotional factors which play an important role in the individual's performance.

Until further studies are made, one must be cautious in advocating one particular method of free throwing over all others.

G. Lawrence Rarick is an associate professor of physical education at Boston University. His collaborator, Wesley M. Staton, is a former B.U. colleague who is now an instructor in physical education at the University of California in Los Angeles.

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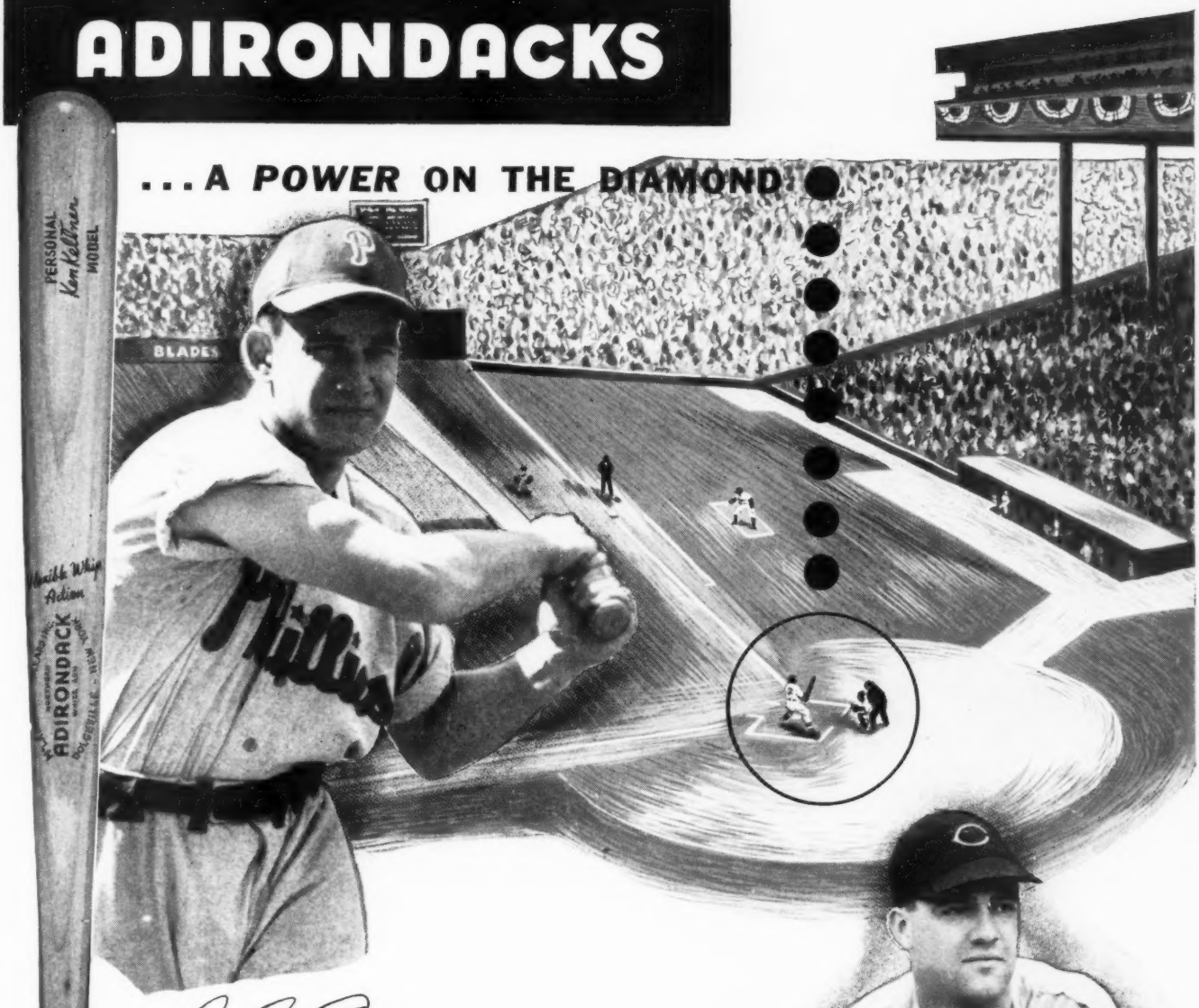

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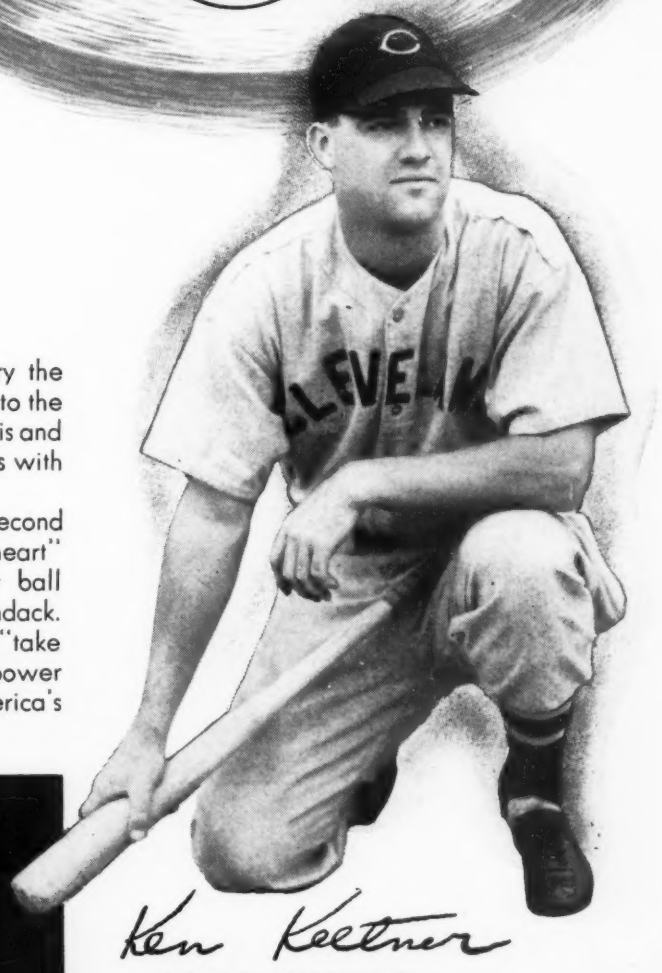

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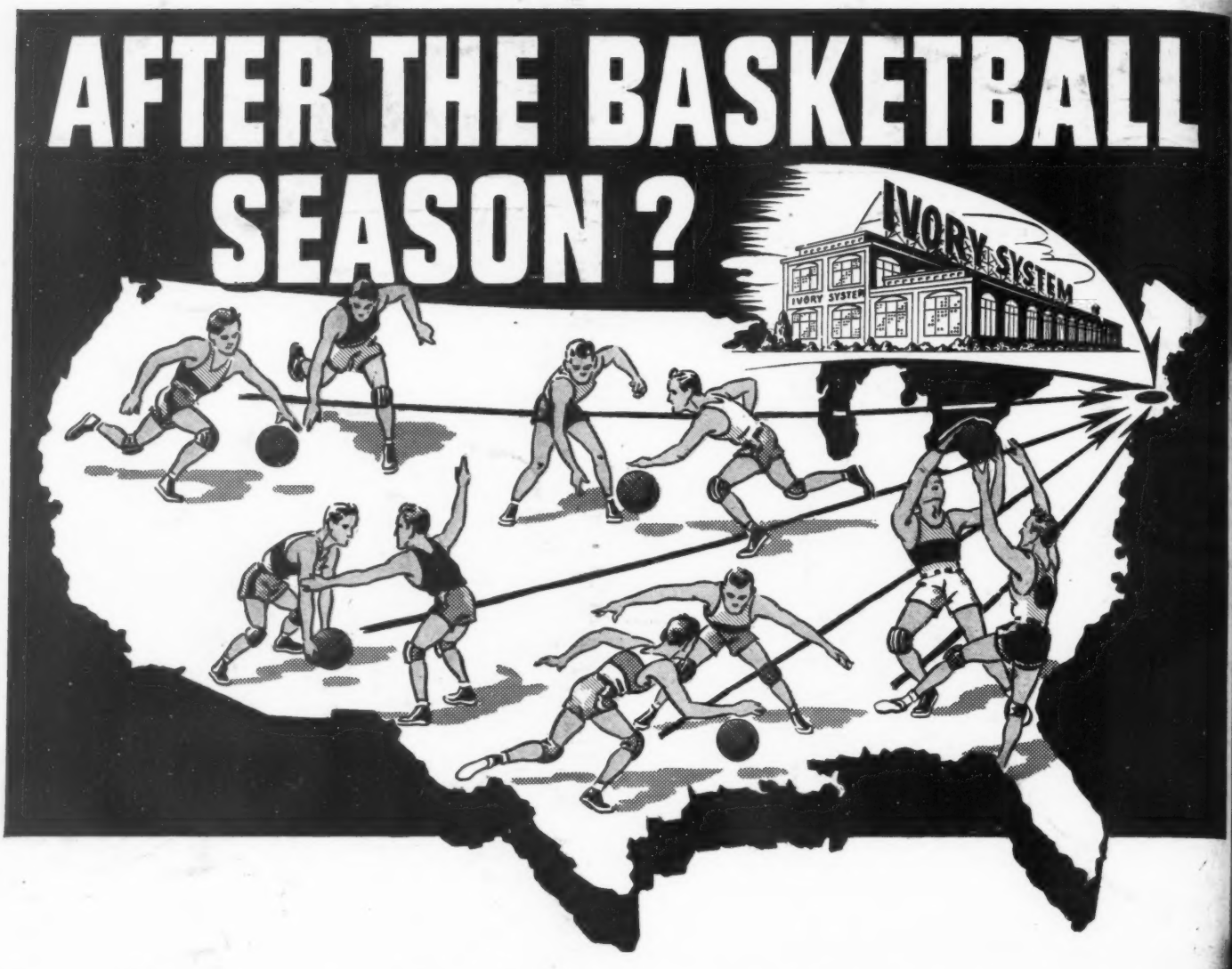

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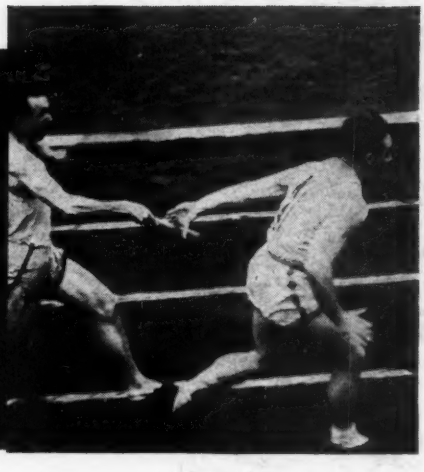

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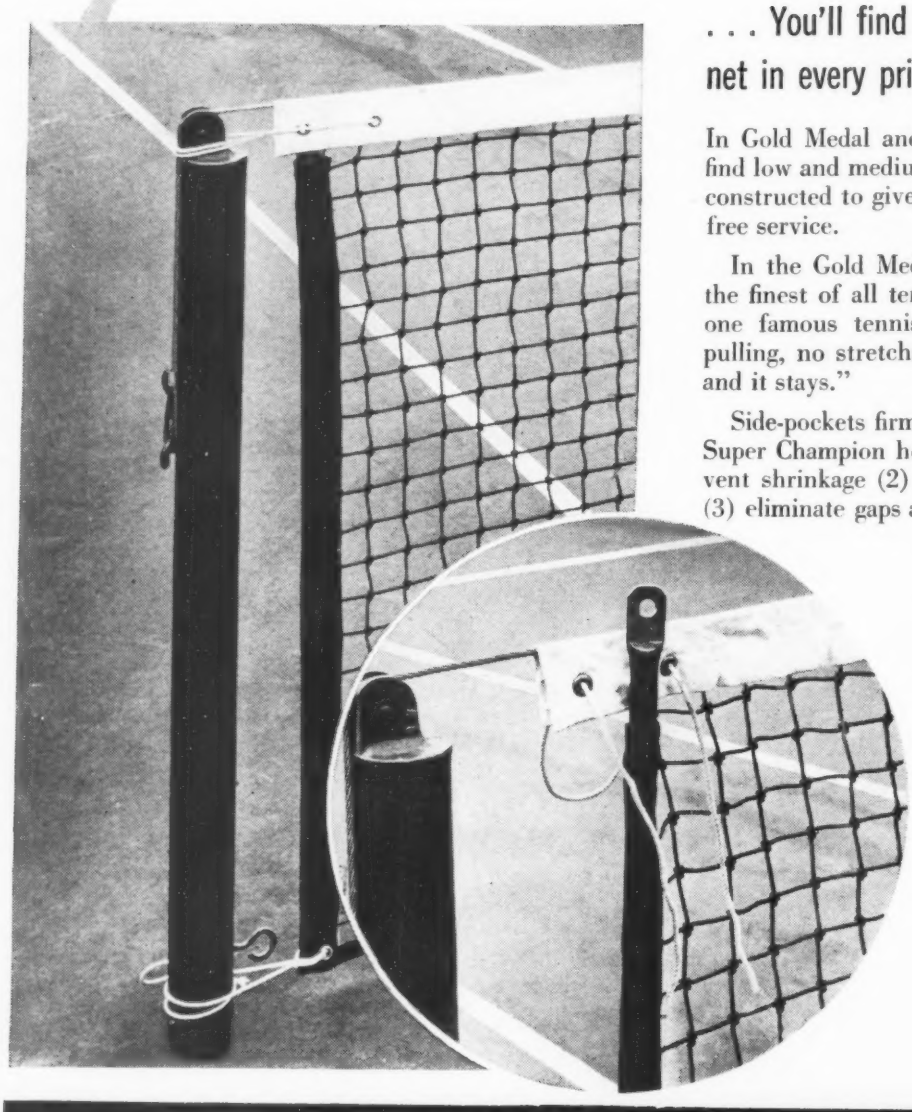

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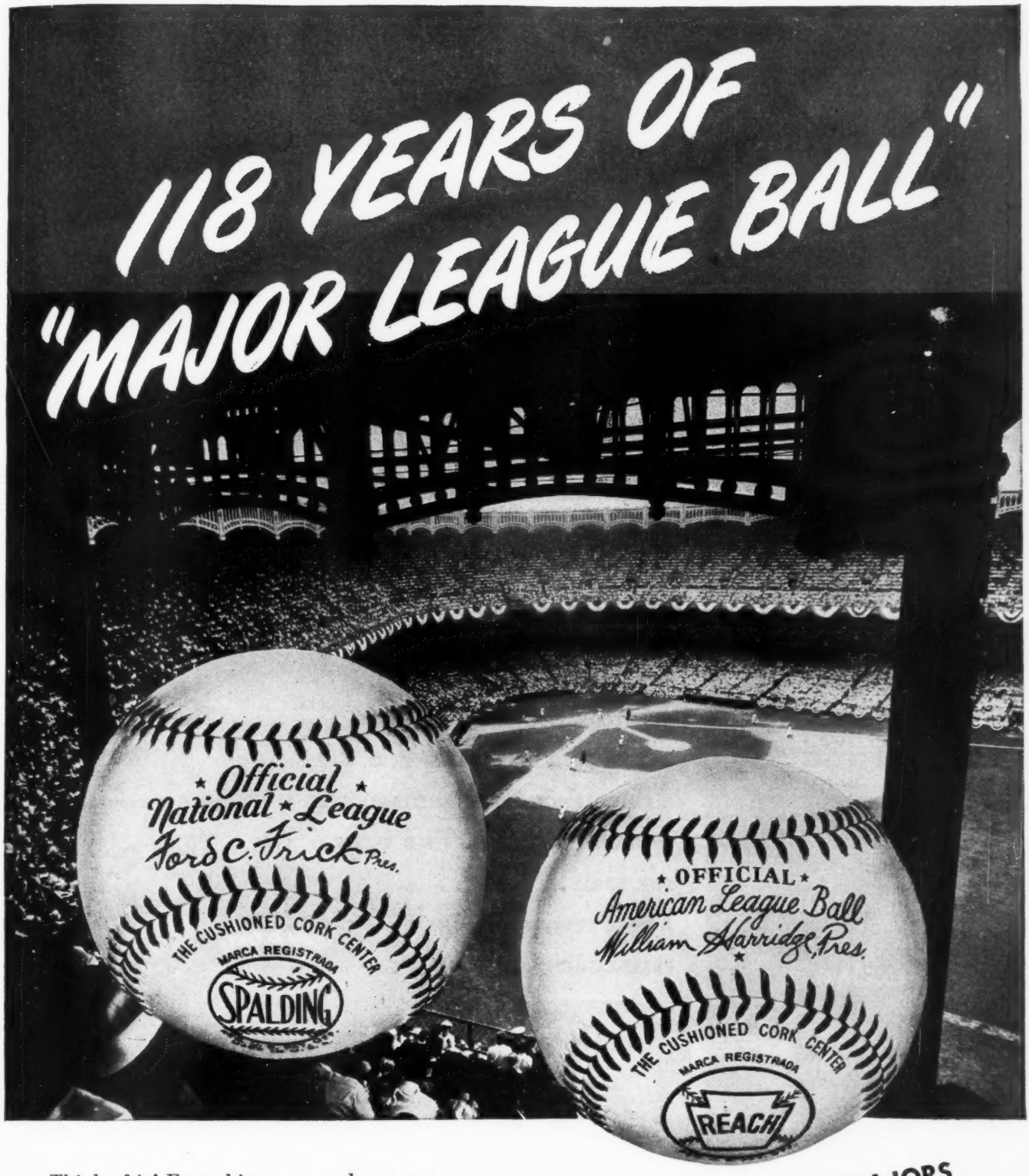

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